SOCIO-ECONOMIC ORGANISATION AND AGRICULTURAL DEVELOPMENT IN NORTHEAST THAILAND. A STUDY OF THE DIFFERENTIAL IMPACT OF IRRIGATION DEVELOPMENT IN THE LAM PAO PROJECT AREA

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ABSTRACT

The problem of the backward Northeast region of Thailand has increasingly attracted the attention of government planners. Poor physical resources have left it behind other parts of the country and growing population pressure and aspirations in the farming community make traditional solutions to the development of the regional economy untenable. The Thai government has sought to offset this physical disadvantage by the development of major irrigation works. One such facility is the Lam Pao project.

One of the major issues of development is the tendency to create inequality. This may occur at a variety of scales, but it is generally unwelcome to the basically social egalitarian philosophy followed by many developing countries. In the Lam Pao project area, survey of selected villages at the time of irrigation development in 1970-73 has emphasised the problem of differential response to development opportunity at the local scale.

Even in the early stages of implementation, accumulation of irrigated land by rich farmers and growth of renting among the disadvantaged has been observed. The discipline imposed by the irrigation system appears to call for increased use of hired labour and this, along with the other inputs required for agricultural intensification and diversification, necessitates greater cash investment. Few farmers have easily available capital and the marketing and agricultural supply networks also favour those few who have.

The agricultural co-operative, an ostensibly egalitarian organisation, has been developed in the area to aid the transition from rain-fed, subsistence to irrigated commercial

agriculture. Confusion of aim and lack of co-ordination have damaged the impact of such organisations. Indeed their effect has been largely to emphasise the advantage of the richer farmer. Analysis is made of the role of farmer associations and suggestions are made in regard to their possible wider impact in the development effort.

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Glossary of Thai Terms and Measures

(a) Administrative Areas

Changwat	=	Province
Amphur	=	District
Tambol	=	Commune, Township
Muban (Ban)	=	Village
Thesabaan	=	Municipality
Sukapibaan	=	Sanitary District, usually the Municipal Area of Small Towns.

(b) Village and Local Government Officials

Kamnan	=	Commune or Township Head
Puyaiban	=	Village Headman
Puchuay	=	Village Headman's Assistant
Puchuay Cholprathaan	=	Common Irrigator
Khruu Yai	=	Head Teacher
Nai Amphur	=	District Officer
Kaset Amphur	=	District Agricultural Officer
Kaset Changwat	=	Provincial Agricultural Officer
Sahakorn Changwat	=	Provincial Co-operative Officer

(c) General

Nam	=	Water, River
Lam	=	River
Huay	=	Stream, Small River
Nong	=	Lake, Pond
Ban	=	Village
Mat	=	Bundle
Takhraa	=	Basket
Niaw (Sanpatong)	=	Sticky, Glutinous (A Semi-improved Variety of Glutinous Rice)

(d) Measures

(1) Length:

1	Waa	=		=	c. 2.0 Metres
20	Waa	=	1 Saen	=	c.40.0 Metres

(2) Area:

1 Taarang Waa	=	= 4 Sq. Metres
1 Rai	= 20 x 20 Waa	= 1600 Sq. Metres
1 Rai	= 0.395 Acres	= 0.16 Hectares

(3) Volume:

1 Tang	=	= 20 Litres
1 Piip	=	= c.20 Litres
1 Kwian	= 100 Tang	= 2000 Litres

(4) Weight:

1 Picul	=	60 Kilogrammes
1 Tang (Paddy)	=	10 Kilogrammes
1 Tang (Milled Rice)	=	15 Kilogrammes
1 Haap (Paddy)	= 2 x 1 Tang Basket	= 20 Kilogrammes
	= 2 x 1+1/2 Tang	= 30 Kilogrammes
1 Kwian (Paddy)	=	c. 1 Tonne
1 Tang Peanuts (Fresh)	=	c. 7 Kilogrammes
1 Tang Peanuts (Dry)	=	c. 5 Kilogrammes
8-10 Cobs Sweet Corn	=	1 Kilogramme
1 Water Melon	=	c. 1 Kilogramme
30 Eggplants	=	c. 1 Kilogramme
30 Cucumbers	=	c. 1 Kilogramme
5 'Yard-Long' Cucumbers	=	c. 1 Kilogramme
60 String Bean Pods	=	c. 1 Kilogramme
1 Piip Manure	=	c. 9.3 Kilogrammes
1 Haap (2 Baskets) Manure	=	c.24.4 Kilogrammes

(e) Currency

100 Satang	=	4 Salung	= 1 Baht
20-21 Baht	=	1US$ (1971-75)	
50 Baht	=	£1 (1971-72)	
47-48 Baht	=	£1 (1973-74)	
40-46 Baht	=	£1 (1975)	

ABBREVIATIONS IN THE TEXT

(a) International Agencies

U.N.	=	United Nations
U.N.C.T.A.D.	=	United Nations Committee for Trade and Development
U.N.D.P.	=	United Nations Development Programme
F.A.O.	=	Food and Agriculture Organisation
I.L.O.	=	International Labour Office
E.C.A.F.E. later	=	Economic Commission for Asia and the Far East
E.S.C.A.P.	=	Economic and Social Commission for Asia and the Pacific
C.C.I.L.M.B.	=	Committee for the Co-ordination of Investigations of the Lower Mekong Basin
A.D.B.	=	Asian Development Bank
A.S.E.A.N.	=	Association of Southeast Asian Nations
I.B.R.D.	=	International Bank for Reconstruction and Development
I.C.A.	=	International Co-operative Alliance
S.E.A.T.O.	=	Southeast Asia Treaty Organisation

(b) Thai Government Agencies

R.T.G.	=	Royal Thai Government
A.R.D.	=	Accelerated Rural Development
A.S.R.C.T.	=	Applied Scientific Research Corporation of Thailand
D.O.L.A.	=	Department of Local Administration
B.A.A.C.	=	Bank for Agriculture and Agricultural Co-operatives
N.E.D.B. later	=	National Economic Development Board
N.E.S.D.B.	=	National Economic and Social Development Board
N.E.E.D.P.A.G	=	Northeast Economic Development Planning Advisory Group
N.S.O.	=	National Statistical Office
R.I.D.	=	Royal Irrigation Department

(c) Other Countries

U.S.A.I.D.	= United States Agency for International Development
U.S.B.R.	= United States Bureau of Reclamation
U.S.O.M.	= United States Operations Mission
O.D.A.	= (United Kingdom) Overseas Development Administration
S.O.A.S.	= School of Oriental and African Studies

(d) Journals

A.A.A.G.	= Annals of the Association of American Geographers
E.D.C.C.	= Economic Development and Cultural Change

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Harvey Demaine

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CHAPTER I

THEORETICAL CONSIDERATIONS

One of the most frequently discussed issues in the study of economic development over the last two decades has been the relationship between economic growth and divergence or convergence of income disparities between different groups in society or between different geographic regions. At the level of the individual, the problem was first examined by Kuznets[1] who tentatively suggested that, from the scanty evidence available, the concentration of wealth among a small group of people in society was steadily reduced as economic development progressed. This conclusion has been supported more recently by Oshima,[2] who has pointed out that personal income disparities in the countries of Southeast Asia are greater than in the relatively more developed nations of East Asia.

Of more interest to the geographer, however, is the transference of the problem to the spatial context, namely to regional income disparities. Indeed it may be that, although the evidence does suggest that personal income inequalities do converge with economic growth, at the same time,

> "...territorial inequalities in income within regions will be greatly increased." 3

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1. Kuznets, Simon "Economic Growth and Income Inequality." American Economic Review, vol.XLV, (1), 1955, pp.1-28.

2. Oshima, Harry T. "Income Inequality and Economic Growth. The Postwar Experience of Asian Countries." Malayan Economic Review, vol.15, October 1970, pp.7-41.

3. Alonso, William "Urban and Regional Imbalances in Economic Development." Economic Development and Cultural Change, vol. 17 (1), 1968, p.2.

At the present time, the problem of income inequalities in the spatial context may be viewed at a number of scales. At the international level, it is generally observed in terms of the phenomenon of the 'widening gap', whereby the rich countries of the developed world seem to be pulling further away from the so-called underdeveloped countries in terms of per capita incomes; at the national scale, there is apparently a tendency to disparity between the income levels of the prosperous, usually metropolitan, core areas and the decaying or backward peripheral regions; at the local level, it has been noted that, whatever the equality of opportunity afforded, some individuals are better able to take advantage of their opportunities than are others.

Already these trends have been the focus of a great deal of attention, especially at the international level. Here it seems clear that the developing countries have been falling further behind in terms of per capita income or per capita G.D.P. Although this is not necessarily the best measure of relative poverty in that, as Usher[4] has pointed out, any income level should always be related to the cost of living, it does serve as a general measure of a country's prosperity. In theoretical terms it is clear that a developing country with a per capita income level of about $100 must increase its G.D.P. formation at 10% per annum to keep pace with a developed nation with an income level of $1000 which is only increasing at 1% per annum. What is certain, moreover, is that the developing countries as a whole have not been able to attain anything like this comparative rate over more than one or two years at a time, and that it

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4. Usher, Dan "The Transport Bias in National Income Comparisons." Economica, vol.30, May 1963, p.140.

has been rather the developed countries of the world which have registered the most impressive rates of growth in G.D.P. within the last few decades.

Meanwhile, the developing countries have in general recorded much higher rates of population increase than current in the developed lands. This has meant that whatever increases in G.D.P. have been recorded, these have been heavily depressed in per capita terms. The U.N. Statistical Yearbook gives figures for growth rates of G.D.P. for a wide range of countries over the two decades 1950-1970.[5] As may be seen from Table I-1, the highest rates of growth for any country were those achieved by Japan between 1960 and 1969 and by Italy from 1951 to 1960. The highest rate recorded for the developing countries presented is that for Zambia in 1960-68. These are gross rates; if per capita rates are examined, then the performance of the developing lands in no way improves. Kenya, Zambia, Iran and Jamaica all record higher rates than the norm for the developed countries, but others register rates lower than those of the slowest growing developed lands, the United States and the United Kingdom. Some developing countries even show a net decline in per capita income.

At this stage, it is necessary to note that these figures do show a fairly wide range of performance on the part of developing countries and some writers have questioned the value of grouping together countries with such a wide range of experience.[6] It is argued that there is basically a spectrum of

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5. United Nations Organization "U.N. Statistical Yearbook 1971", New York, 1972, Table 181, pp.590-592.

6. Notably P.T.Bauer in his "Dissent on Development", London, 1971, p.49ff.

TABLE I - 1

Rates of Growth Per Annum: Gross Domestic Product
G.D.P. per Capita (Market Prices)

Selected Countries

Country	% Growth	Gross Domestic Product	% Growth	G.D.P. per capita	Period
ZAIRE		3.4		1.0	1966-68
KENYA		6.8		3.8	1964-69
MALAWI		3.6		1.1	1954-60
		1.0	-	1.4	1960-63
GHANA		2.2	-	0.4	1960-69
ZAMBIA		6.3		3.4	1954-60
		8.2		5.0	1960-68
JAMAICA		7.6		5.9	1953-60
		4.8		2.7	1960-66
BRAZIL		6.6		3.6	1950-60
		4.1		1.1	1960-66
URUGUAY	-	0.6	-	2.0	1955-60
		0.4	-	0.9	1960-68
INDONESIA		2.2	-	0.2	1960-68
IRAN		7.7		4.8	1960-67
PAKISTAN		5.7		3.5	1960-67
BELGIUM		2.7		2.0	1953-60
		4.5		3.8	1960-68
FRANCE		4.4		3.5	1950-60
		5.6		4.4	1960-68
W.GERMANY		7.7		6.6	1950-60
		4.5		3.4	1960-69
ITALY		9.9		5.1	1951-60
		7.7		4.2	1960-68
UNITED KINGDOM		2.7		2.3	1950-60
		3.0		2.3	1960-68
UNITED STATES		2.9		1.2	1950-60
		5.1		3.7	1960-68
JAPAN		8.0		6.8	1952-60
		10.3		9.2	1960-69

Source: UNITED NATIONS Statistical Yearbook 1970 Table 181 p.590-2

income levels and any division of this spectrum is necessarily arbitrary. On the other hand, it should be noted that income levels are not the only criteria for drawing a distinction between developed and underdeveloped countries, that the terms do not preclude movement from one group to another and that the argument is admittedly generalised. Just because, as Bauer points out,[7] there are countries with characteristics one or two standard deviations from the group norm, it does not necessitate the total abandonment of the concept of developed and underdeveloped lands.

Whether or not this classification is intellectually satisfying, .. :ome gap between rich and poor countries seems real enough to many governments in the 'Third World'. The apparent causes of the existing situation proposed by such governments are many and various. Some have blithely blamed their colonial experience without adequately explaining how this has affected their performance. More coherently, the gradually worsening terms of trade between the primary producers, in which category most of the developing countries may be included,[8] and the industrialised countries, which have been generally equated with the developed lands, have been cited as a major cause of the trend. Although historically this may not have been the case, over the last two decades the developing

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7. Ibid.

8. It is, of course, true that underdeveloped countries are not identical with the primary producers or vice versa and that certain primary products, notably petroleum and some minerals are in great demand. In 1972-74 indeed many world commodity prices shot up to unprecedentedly high levels. It is assumed that for most commodities such increases constituted a temporary phenomenon, but it is clear that qualifications to the above suggestions must be made for oil-producing countries and other such fortunate nations.

countries do seem to have been accounting for a falling proportion of total world trade. Although the overall growth in world trade means that their contribution is increasing in total volume, according to the I.B.R.D., the share of the developing nations has fallen from 30% in 1948 to 18% in 1970, whereas the share of the developed countries, not including the centrally planned economies, has increased from 63% in 1948 to 71% in 1970.[9]

It is true that the terms of trade situation is not the only factor involved in relative rates of economic expansion, but it has attracted most of the attention of the representatives of developing countries in international seminars. Since 1964, the meetings of the United Nations Committee for Trade and Development have been concerned mainly with the improvement of the trading position of the developing lands. According to their delegates at the first U.N.C.T.A.D. session in 1964, the developing countries required measures to correct the imbalance, such as extended use of commodity agreements for primary products, compensatory payments for changes in prices of these products and the grant of preferences in developed countries for the manufactures of the less developed nations, without corresponding reciprocity on behalf of the developing countries.[10] Other writers have put forward more far-reaching suggestions. Myint[11] quotes Harrod in noting that

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9. International Bank for Reconstruction and Development, "Trends in Developing Countries", Washington 1971.

10. Johnson, Harry G. "Economic Policies Towards Less Developed Countries.", London 1967, Appendix B, pp.251-254.

11. Myint, Hla "The Economics of the Developing Countries", London 1964, p.159.

> "It is, of vital importance that policy-makers in the mature countries should now be envisaging a state of affairs in the not-too-distant future in which a high proportion of their citizens' demand for 'traditional products' are supplied from the developing countries overseas." 12

To date, despite other more recent conferences, these schemes for organizing the world economic system in a more regulated manner have come to very little. Indeed bodies like the European Economic Community have rather tended, despite their provisions for underdeveloped associate members, to work against any improvement in the trading position of the developing lands. Some of the industrialised nations have seen economic advantages in making use of the cheaper labour in the developing countries, like Japan and South Korea and a number of Southeast Asian countries, but too often the investment has smacked of neo-colonialism to the recipient country.[13]

If the problem of income inequalities has been difficult to solve at the international scale, at the national scale individual countries are at least able to develop their own policies to try to overcome it.[14] The problem of backward

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12. Harrod, Sir Roy "Economic Development and Asian Regional Co-operation", Pakistan Development Review, Spring 1962, p.4.

13. As was demonstrated by the public reactions in Bangkok Kuala Lumpur and Djakarta on the occasion of Japanese Prime Minister Tanaka's visit in January 1974.

14. It is notable that this factor is the only one which leads Hirschmann to suggest that a backward region's problems may be more easily solved within a wider polity than as an independent nation. Whereas some regions may benefit from an association with more developed regions, for others the disadvantages of polarization might be offset if they were in fact independent. See Hirschmann, A.O. "The Strategy of Economic Development" New Haven 1958, pp.195-199.

or decaying regions has been recognised for a much longer period than disparities in economic development among nations, probably due to the fact that this problem is to be found within the developed lands themselves, whereas most of the world's poorer nations have only recently gained voices of their own on the world's councils. As a result, a number of economic theories, known broadly as 'regional inequality models' have been developed to describe and explain the typical situation.

Myrdal, for example, in his "Economic Theory and Underdeveloped Regions" put forward a model based on the contention that in a free economy particular changes do not

> "call forth countervailing changes, but, instead, supporting changes which move the system in the same direction as the first change but much further." 15

so that

> "the play of market forces tends to increase, rather than to decrease, the inequalities between regions." 16

Hirschman follows Myrdal in visualising the initial growth of an imbalance between regions, but differs in his interpretation of the final outcome. Whereas Myrdal sees 'backwash' effects on the deprived regions in the form of migration of the more enterprising sections of the population, movement of capital out of the region and the suppression of local industry as productive of an ever-worsening situation, Hirschman suggests that this is overly pessimistic in that Myrdal's

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15. Myrdal, Gunnar "Economic Theory and Underdeveloped Regions." London 1957, p.13. In Myrdal's shorthand terminology, it is a matter of the 'spread' effects of development out from the centre being outweighed by disadvantageous 'backwash' effects.

16. Ibid., p.26.

> "..preoccupation with the mechanism of cumulative causation hides from him the emergence of the strong forces making for a turning point once the movement toward North-South polarization within a country has proceeded for some time." 17

Hirschman admits that the turning point in this depends on the degree of interdependence of the regions. Whereas, if the developed area (the North in Hirschman's nomenclature) relies to a significant extent on the supply of products from the backward region (the South), then 'trickling-down' effects beneficial to the South would soon be dominant, if the North is largely self-sufficient in its required raw materials, if it chooses to import them from other lower cost producers or if it elects to use substitutes, then the South is largely cut off from the 'trickle-down' effects. Nevertheless he believes that eventually the economic pressures of increasing costs and market limitations in the North towards the operation of trickling-down effects will assert themselves and lead to a reduction of interregional income disparities.[18]

Hirschman's theoretical analysis is supported by the evidence gathered together by Williamson. He considers the relationship between regional income disparities and levels of economic development, as measured by income per capita, in 24 countries for which data are available. Williamson observes that the largest regional differentials are to be found in countries with intermediate income levels, compared to the relatively small disparities present among highly developed nations and among those with relatively little experience of

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17. Hirschman op.cit. p.187, footnote 5a. Hirschman's 'trickling-down' and 'polarization' correspond to Myrdal's 'spread' and 'backwash'.

18. Ibid. pp.189-190.

economic growth. This finding appears to be confirmed in the second part of his analysis in which time-series data for ten countries are examined. From this he concludes that

> "increasing regional inequality is generated during the early development stages, while mature growth had produced regional convergence or a reduction in differentials." 19

In the context of the Rostovian model, Alonso notes that, following Williamson's conclusions,

> "regional inequality, if plotted against economic development, would result in a bell-shaped curve, with some peak being reached at the transition from the take-off to the mature stage." 20

Williamson's findings, while significant, call for careful examination. It must be noted that the deficiency of suitable data in most of the less developed countries restricted his analysis mainly to the upper end of the development scale. Of the 24 countries examined, at the present time only Chile, Colombia, the Philippines and India may be termed as truly underdeveloped. Moreover the comparability and reliability of both the income data, for which a variety of measures were used, and of the basis of the regional division must be open to some doubt. As Gilbert and Goodman have pointed out

> "The large rural-urban disparities in (India) were hidden by the inclusion of most urban centres within administrative areas containing large rural populations. By contrast, the data for the Philippines, which showed a high level of regional inequality, were based on a regional

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19. Williamson, J.G. "Regional Inequality and the Process of National Development. A Description of the Patterns." Economic Development and Cultural Change, vol.13, no.4(2), July 1965, p.44.

20. Alonso, op.cit. p.9.

distribution which included metropolitan Manila as a separate entity." [21]

The greatest criticism of Williamson's findings concerning the whole relationship of income disparities and economic development must lie in the lack of evidence of the early stage of the process. Gilbert and Goodman have noted this and have attempted to remedy the failing through the examination of more recently published data for less-developed countries. Although the greatest indices of divergence are associated with the countries with lowest income levels (Tanzania and Kenya), there is no evidence of any particular trend with rising levels of per capita income. Nor does comparison of the more recent data with that utilised by Williamson suggest that rising economic development at this level of income corresponds to either convergence or divergence of regional income inequalities.[22]

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21. Gilbert, Alan and Goodman, David "Regional Income Disparities and Economic Development; A Critique of Current Opinions." Paper presented at the Institute of British Geographers Study Group on Developing Areas Symposium, "Income Disparities and Development", Oxford, January 1975 p.5.

22. Ibid. pp.6-7. Gilbert and Goodman use the same indices in measuring the level of income inequality as does Williamson, namely a coefficient of variation, unweighted or weighted by the respective regional shares of the national population. The formulae are:-

$$V_{uw} = \frac{\sqrt{\frac{\sum_i (Y_i - \bar{Y})^2}{N}}}{\bar{Y}}$$

where N = the number of regions
Y_i = the income per capita of the i^{th} region
$\bar{Y}$ = national per capita income

$$V_w = \frac{\sqrt{\sum_i (Y_i - \bar{Y})^2 \frac{f_i}{n}}}{\bar{Y}}$$

where f_i = population of the i^{th} region
n = national population

Although the empirical evidence does not as yet seem incontrovertible, there would appear to be some convergence of regional income inequalities at the higher levels of economic development. One factor seen as significant in this convergence is the development of government policies to correct the imbalance. Indeed, to Hirschman, this is the main factor in the eventual removal of the inequalities.[23] Certainly this has become an important policy in the developed countries in the fight to reduce levels of income inequality. In Britain tax holidays, tax incentives, building subsidies and many other measures have been used to revitalise the areas of high unemployment and decaying industry. These policies have had a strong justification on both economic and social grounds, utilising existing resources of fixed capital and skilled labour, where the costs of creating new facilities and of large-scale population movement would be extremely high. Even so, the pull of the country's metropolitan area has been strong enough to necessitate the application of increasingly stronger incentives.

In the developing world, the strong centralizing tendency of the primate city is perhaps even greater than in the great cities of the developed world. It is not that the metropolitan influence in itself is stronger, but that there are fewer counter-attractions in the provinces. Most developing countries are predominantly agricultural and the metropolitan dominance extends equally to this sector. Recent work has suggested that there is a distance-decay function in innovation acceptance away from the major urban centres in south India[24]

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23. Hirschman op. cit. p.198.

24. Bradnock,R.W. Personal Communication.

and the availability of credit and other agricultural supplies seems equally to be related to the proximity of urban centres according to a recent study in Uttar Pradesh.[25]

In the developing countries this problem is further emphasised by a number of other considerations. The industrial sector being less developed, there is less chance of the government being able to create new centres of industrial employment in the outlying areas. The concentration of opportunity on the large centres attracts population to these places in the often unfulfilled hope of finding employment and resulting in severe urban social and managerial problems. A second problem arises out of the relative lack of consolidation of the national territory in many developing countries. The peripheral regions are often occupied by minority groups whose allegiance to the state is generally doubtful. In some cases the unconscious discrimination in economic opportunity brought about by the centralising tendencies noted above has generated political unrest. Moreover, attempts to incorporate these groups into the state more fully by improving transport and communications often only accentuates the problems by either encouraging selective migration or by emphasising the differences in standard of living between the peoples.

Such problems have tended to cause the governments of the developing nations to adopt specific policies towards their backward regions in much the same way as the countries of the

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25. Allan, J.A. "The Participation of Farm Operators in Recent Rural Development Programmes in North West India. Some Preliminary Results of a Study of the Bulandshahr District, Uttar Pradesh." Unpublished Seminar Paper, Department of Geography, School of Oriental and African Studies, November 1972.

western world. Such policies, moreover, have a strong philosophical justification for these countries most of whose administrations profess to follow basically socialist and egalitarian beliefs. In spatial terms this involves a distribution of the country's wealth as evenly as possible throughout the territory. It seeks to avoid any overwhelming concentration of wealth and opportunity and to channel investment in the backward areas especially in the form of welfare services. Perhaps this development philosophy has found its fundamental expression in the non-communist third world in the writings of M.K. Gandhi, whose traditionalist view was to take all productive capacity back to the village level through the establishment of rural-based industries.

In fact, even in India, the government, while paying lip service to Gandhian philosophy, has been only half hearted in their acceptance of his views. Although craft industries have been encouraged and small-scale industrial estates established, most of Indian industry remains strongly centralised. The dilemma of the Indian planners is similar to those encountered in a number of countries and is central to any debate on economic development. Whereas the spread of economic opportunity and investment thinly over a country's territory may be philosophically correct, it is rather unlikely to generate the most rapid economic progress and may indeed waste valuable capital resources. On the other hand, the concentration of capital on the area where it is most likely to generate the greatest growth is likely to create the problems outlined earlier. In practice, the tendency has been to seek a compromise between the two approaches by establishing regional growth centres or 'growth poles'[26]

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26. The term coined by Perroux, "Note sur le notion de pole de croissance.", Economie Appliquee, January-June,1953.

in favourable situations in all regions of a country.

According to Hoselitz,[27] the creation of a growth pole would transmit a stimulus for growth into the surrounding areas in a number of ways. In addition to creating a demand for labour, such centres produce a need for industrial raw materials from the surrounding region and increase the demand for food from the countryside. Thus it is argued that the wealth created in the most favoured area will spread throughout the rest of the region.[28]

In fact, the growth pole approach, while it may give some element of prosperity to backward regions, only transfers the problem of income disparities to another level. Just as the metropolitan area can concentrate wealth at the national level to the detriment of the situation in the regions, so within each region the 'growth pole' may concentrate resources and the 'backwash effects' noted above may overwhelm possible counter-balancing factors. This may be true not only of the creation of the urban growth centre as visualised by Hoselitz, but also in investments in the rural sector. Improvements in communications in a certain area or the creation of irrigation projects may benefit a certain number of farmers, but, unless other developments are planned alongside these facilities, they can create income disparities at the local scale.

At a yet smaller scale, in planning programmes for agricultural extension and modernization within developing

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27. Hoselitz,B.F. "The Role of Cities in the Economic Growth of Underdeveloped Countries.", Journal of Political Economy, vol.61(3), 1953, pp.195-208.

28. For expansion of this argument see Keeble,D.E. "Models of Economic Development",in Chorley,R.J. and Haggett,P. (eds) "Models in Geography", London 1967, pp.281ff.

countries, similar problems may be encountered. According to the growth pole theory of development, it is preferable to concentrate the limited resources of both materials and trained extension staff available on a small number of farmers who are best able to respond to the new opportunities offered. By the success of these few, it is then argued, other farmers will be encouraged to take up the innovation as they see its advantages. Thus will the knowledge and application of the new techniques be extended throughout the whole farming community.

Unfortunately such 'growth pole' policies rarely seem to have achieved this success. For some innovators, sanctions within the traditional community may blunt the initiative of any individual farmers; to make use of irrigation water particularly, the co-operation of a large number of farmers is necessary. Again, where extension activity is concentrated farmers must be carefully chosen if the technique is to be successful; if those participating are selected at random, then the extension effort can be wasted by the failure of farmers to take to the innovation. For this reason the original farmers in a scheme based on growth pole philosophy tend to be selected from the more progressive in the community. It may be too that these innovators will be given their supplies of seed, fertilisers or whatever is being encouraged, free by extension officers to ensure their full participation in the project. After the initial drive, on the other hand, it is likely that these pioneer farmers and any new participants in the programme may be required to purchase their inputs at the full, often prohibitive, market rate.

This situation tends therefore only to benefit the richer farmers who are able to risk the heavier capital outlays, a

group who may be synonymous with those recognised as most progressive by the extension services. As a result these are the farmers who get most benefit from the innovations and a widening range of income levels within the traditional farming communities is produced. This has been particularly the case since the advent of the so-called 'Green Revolution'. This does not consist merely of the introduction of new high-yielding seeds, but also requires, if the seeds are to give any benefit, further cash inputs of insecticides and fertilisers, water control and the creation of other facilities. Already the adverse effects of the 'Green Revolution' have drawn comment from a number of writers.[29] A recent paper by Smith et al. has given detailed examples from both Turkey and Tanzania of the differential benefits of the modernisation process in agriculture. Of the 'Green Revolution' they suggest that while it

> "..seems to be the technic (sic) answer to a large range of social, economic and political problems, (it) proves to be in many cases only a benefit to those who own the better and bigger parts." 30

In the Asian context, the Economic Commission for Asia and the Far East has noted that

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29. Notably Byres,T.J. "The Dialectic of India's Green Revolution.", South Asian Review, vol.5(2)., January 1972, pp.99-116. Wharton,Clifford R., "The Green Revolution: Cornucopia or Pandora's Box", Foreign Affairs, vol.47(3), April 1969, pp.464-76.

30. Smith,C., Templeman,G-J, and Verkoren,O. "Modernization and Inequality" Paper presented to the Developing Areas Study Group Symposium, Institute of British Geographers Annual Conference, Birmingham, January 1973, p.5.

"Generally speaking, it is the larger-scale economic unit, which has access to capital, which has benefited most." 31

The creation within individual farming communities of a widening income gap is regarded with some concern within the developing countries. The spectre of the potential creation of a dominant landlord class out of the richer farmers and the development of an indebted or landless majority is relevant to the experience of many ex-colonial territories. In India, for example, there was the rise of an indigenous class of village capitalists in the shape of the Zamindari; in Lower Burma, it was an alien group, the Tamil Chettiar moneylenders, who dominated a group of absentee landlords who came to own almost 50% of all holdings on the eve of the Second World War.[32]

It is partly for this reason, partly in the context of a general planning philosophy, that the developing countries are generally unwilling to allow the undisciplined development of agriculture at the present time. With basically socialist principles held by most governments of developing countries, trends towards the creation of a landlord or capitalist class at the village level are an undesirable feature of development. Although there is no sentimental attachment to the traditional village society on the part of most leaders, its largely egalitarian community structure supports arguments for its maintenance. Thus it is hoped to fashion economic development through the steady evolution rather than the complete break-up of that society.

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31. Economic Commission for Asia and the Far East, "Economic Survey of Asia and the Far East 1970", Bangkok 1971, p.3.

32. Andrus, J. Russell "Burmese Economic Life", Oxford 1948, Table 12, p.70.

Government policy in developing countries has therefore sought to create conditions under which the opportunities of development are open to all farmers and not just a favoured few. In the search for a planning tool through which this general policy could be carried out, many governments have turned to the concept of co-operation. In that, from its earliest development in agriculture, the co-operative has been designed to help small, independent farmers to improve their economic position, this concept has naturally recommended itself to the governments of countries in which the great majority of the population are small landowners. On the other hand, there has been over the years an increasing confusion and misrepresentation of the basic co-operative principles. Writers have tended to ascribe to co-operatives qualities which they were never originally intended to have and their success in developing countries to date has been coloured by this misrepresentation of purpose.

In many countries, farmers' associations and co-operatives have played a significant part in assisting the change from the traditional practices of a mainly subsistence agriculture to the techniques of modern commercial farming. The idea for farmers to join together to create for themselves a better bargaining position originated in Europe where F.W. Raiffeisen pioneered rural credit co-operatives in Germany and where the Danish movement extended the system to fields of supply and marketing to the extent that co-operatives continue to dominate Danish agriculture today.

It was the general effectiveness of such farmers' associations in helping the small farmer in Europe which recommended them to the governments of many of the world's developing countries.

The first agricultural co-operative to be founded outside Europe was in India in 1897[33] and since then similar organisations have been established in many countries. Nor have co-operative organisations been unsuccessful in the Third World. In Asia, the particular examples of Japan during its economic transformation towards the world's third industrial power and of Taiwan following the Chinese Nationalist takeover stand out. In Africa, co-operatives have also assumed an important rôle in the economies of a number of countries. One report has noted that

> "In Tanganyika (sic) agricultural co-operatives account for more than a third of the total exports of agricultural produce....the cotton harvest passes, almost in its entirety, through co-operative channels...Almost 100% of the country's coffee crop is now co-operatively marketed." 34

While in Kenya 86% of the total coffee crop is co-operative produced.[35]

On the other hand, the examples of these countries have proved difficult to emulate within the greater part of the developing world. In Africa, the development of co-operatives has perhaps been easier than elsewhere, particularly in the field of marketing and supply on account of the lack of competition from other marketing channels. There has been scope for the development of cash-cropping on new lands without the necessity of large-scale capital investment. In Asia, on the other hand,

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33. Gretton,R.H. "Agricultural Co-operatives", Bonn 1969, p.13.

34. International Labour Office, "The Role of Co-operatives in the Economic and Social Development of Developing Countries", Geneva 1965, p.22.

35. Ibid.

the circumstances in which co-operatives have succeeded appear to have been highly individual. In Taiwan, the takeover by the Chinese Nationalist government forced a completely new start as far as economic organisation was concerned. Immediately emphasis was placed on co-operatives, but these were carefully supervised by the government, incorporating resettlement schemes not only for farmers but also, in the so-called 'Ta-Tung' co-operatives, for ex-servicemen.[36] In Japan too, special circumstances prevailed. In their search to accelerate the industrial development of the country, the Japanese government used the co-operative movement as a major tool for achieving their goals, Activities were heavily subsidised and in the 1930s an active policy to include all farm households in these associations was pursued. Today 90% of the rice and 80% of the fertiliser sold is traded by agricultural co-operative associations.[37]

In other developing countries, the co-operative movements have met with rather less success. Sie Kwat Koen, talking of the co-operative movement in Indonesia, notes shortcomings in organization and unfamiliarity with co-operative methods as the major factors in reducing its effectiveness.[38] Most of the institutions in Asia have concentrated on providing credit facilities for farmers and many have experienced repayment problems. This has particularly been the case in the Philippines

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36. Yen-Sung Chen, "Development of the Co-operative Movement in the Republic of China", Co-operative Information No.2, International Labour Office, Geneva 1970, p.61.

37. Spaeth, David H., "Quasi-Co-operative Arrangements; the Japanese and Taiwanese Experience" in Anschel et al., (eds) "Agricultural Co-operatives and Marketing in Developing Countries", New York 1969, p.295.

38. Sie Kwat Koen, "Prospects for Agricultural Development in Indonesia" Wageningen 1968, p.148.

where Korzan has demonstrated that

> "Of the 602 Philippine farmer co-operative associations listed as being in existence in 1967, only 217 were active" 39

mainly as a result of repayment problems and Cabrera sees this as a permanent problem in financing small farmers.[40] In the Philippines, as in Indonesia, moreover, organisational difficulties have confronted the government co-operative planners.

Part of the difficulty in improving the performance of co-operatives in the developing world has resulted from a certain confusion of objective. As was noted above, the co-operative has been seen very much as a tool in the wider context of socialist egalitarian philosophy. By contrast, the early pioneers of co-operation saw the co-operative as a competitive element within the capitalist economic system. Gretton, following the classical school of Raiffeisen and Plunkett defines a co-operative in its agricultural context as

> "an association of farmers who join together voluntarily on an equal footing to achieve a common purpose, who retain the right to exercise full control over its affairs and who share any resultant savings in proportion to the extent each has participated." 41

Although socialist principles are implied in parts of this definition, the concept of profit-sharing according to patronage implies the function of a capitalist system. By contrast, writers of the nineteenth century socialist school, like Blanc and

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39. Korzan,G.E., "Co-operatives and Economic Development" Thailand Development Report, vol.IV(3), December 1968, p.8.

40. Cabrera,S.G., "Recovery Problems in the Philippines" in International Co-operative Alliance, "Agricultural Co-operative Credit in South-East Asia", London 1967, p.142.

41. Gretton, op.cit., p.11.

Saint-Simon, saw the co-operative as a means of eliminating the competitive capitalist system and replacing it by a system of mutual assistance. This return to the subsistence economy propounded by the followers of what Helm terms the 'co-operative commonwealth school'[42] has been echoed at a later date by such as Gandhi with his desire for a return to the traditional village as the basis for development.

Co-operatives also had a role to play in the schemes of Marx and Lenin. Here the co-operative is seen as a stage in the progress towards a communist society; Marxist-Leninist teaching on co-operatives insists on their importance in the context of the overall class struggle within society.[43] Co-operatives would combine the interests of the working peasants with the general economic requirements of the country.

The incorporation of the concept of co-operation into a wide spectrum of political theory has doubtless helped in promoting the idea in the developing world. Many developing countries have reacted to their former colonial status by rejecting the capitalist system practised by the former colonial power which was held responsible for the exploitation of the indigenous population. Even where capitalism has been adopted, encouragement of the co-operative movement has seemed relevant to a development process with an egalitarian emphasis. Gretton contends that for developing countries

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42. Helm,F.C. "The Economics of Co-operative Enterprise" London 1969, p.2.

43. Golikov,V. "Agricultural Co-operatives: Their Role in the Development of Socialist Agriculture in the Soviet Union", Moscow 1971, p.18.

> "..there is a double justification for co-operatives; to overcome the weakness of the individual producer and to lift him out of his old habits into the world of modern agriculture." 44

While it may be that the co-operative organisation, properly administered, is capable of fulfilling these objectives, it has been common for proponents of co-operatives to overstate their potential. Co-operatives have been visualised in the role of a bulwark against the growth of a capitalist class within rural areas. All too often they have been vaguely taken to be a panacea for all social and economic problems in the rural sector. Even the development agencies have uttered bland statements like

> "Co-operative living brings out the best that is in man and lifts him to a higher plane of life." 45

The co-operative has been held too to be ideally fitted to generate development without violent social change within the traditional communal pattern of village life. It is argued that community action is typical of such societies. Unfortunately this idea conflicts with the concept of the co-operative as an agent for generating rural change and it misinterprets the nature of co-operative action in the traditional society. In fact co-operatives tend to work mainly in those areas which are not traditional foci of village co-operation.

Whatever their concept of the qualities of the co-operative movement, however, many governments in the developing world have fostered co-operative institutions. Whereas in Europe the early co-operatives were organised through the initiative of the farmers

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44. Gretton, op.cit., p.11.

45. Food and Agriculture Organisation, "Training and Extension in the Co-operative Movement", Rome 1962, p.8.

themselves, recent foundations in the third world have been made as a plank in government policy. The strength of government commitment has varied from country to country. Some governments have sought to put co-operative organisations in a favoured position within the economic structure of the country. The case of Tanzania has already been noted; in Burma too the co-operative movement became a major part of the policy of 'Burmanisation' in the late 1950s and early 1960s. Here co-operatives were established to replace the former private sector marketing system which had been controlled by alien elements in Burmese society.[46] Elsewhere, governments have taken a more laissez-faire attitude to co-operative development, allowing co-operatives to find their own role in the economic structure in competition with existing facilities.

This has been the case in Burma's neighbour, Thailand. Of the countries of Southeast Asia, Thailand has been one of the least affected by socialist doctrines. Traditionally she has had a history of autocratic rule with inherent social inequality. Nevertheless, especially since the coup of 1932 led by Pridi Phanomyong and Phibun Songgkhram, there has been an effort by the government to assist agricultural development. Although progress towards democracy has been uneven and even after the 1975 coup the government can scarcely be said to be socialist in conviction, the co-operative movement has been seen throughout as a major instrument in the development and modernisation of

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46. International Labour Office, "Report to the Government of the Union of Burma on Co-operative Marketing", Geneva 1968, p.3.

agriculture.[47]

It is in this context that the present study will examine some of the issues raised in the foregoing discussion. Thailand has long been able to rely on a stable and favourable market for its staple product rice. In recent years this market has seemed less assured and the need for diversification of the existing agricultural pattern has been recognised. This is particularly the case in the Northeast region of the country where environmental conditions and historical neglect have contributed to a narrowly based economy and a much lower income level than in the other regions of the country. In order to correct this imbalance the Royal Thai Government has invested heavily in major capital projects like roads and irrigation projects. As was noted above, such an approach has its weaknesses and it is not surprising that, in Northeast Thailand, these capital projects have tended to favour particular localities in the region.

While the problems of income inequalities will be considered briefly at regional and sub-regional scales, it is with the problem at the local level that this study is chiefly concerned. The contention that agricultural development is likely to increase income disparities within traditional communities will be examined in the context of one of the major irrigation projects in the Northeast region where in the past farmers have depended on unreliable monsoon rainfall for their livelihood.

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47. The present government, headed by M.R.Kukrit Pramoj, is a coalition of a number of small parties of widely differing political persuasions. It is hardly likely that other than moderate compromise policies will emerge from it.

The traditional response of the farmers to rain-fed cultivation is examined in detail and the changes induced by the introduction of the new irrigation facilities are assessed. The work of government institutions in the form of co-operatives in assisting farmers to make the necessary readjustments will then be investigated and their ability to make an effective contribution to reducing the strains of development will be adjudged. These issues are discussed in Chapters IV-VIII. First the study is set in the context of the present economic situation in Thailand in general and in its Northeast region in particular. (Chapter II) This is followed in Chapter III by a description of the area of study in the Lam Pao irrigation project area in Kalasin province and of the methods of study used in the examination of the problems under consideration.

CHAPTER II

ECONOMIC PROBLEMS OF THAILAND AND ITS NORTHEAST REGION

I : Thailand in the World Economy

The entry of Thailand into the world economy came in 1855 when the British emissary, Sir John Bowring, finally persuaded King Rama IV[1] to agree to concluding a trade treaty with the United Kingdom. This initial trade agreement was followed by a whole series of such treaties with other European powers and with the United States which left Thailand as the economic preserve of no one colonial power. By playing off the interests of these competing nations against one another, Thailand's rulers managed to maintain the country's political independence from colonial rule, but, nevertheless, her economy was condemned to develop in the classic colonial fashion.

Muscat, using the classification of Hoselitz,[2] has described the early development of the Thai economy as

> "..autonomous, satellitic and expansionist."[3]

Here the term 'expansionist' refers to the increase in the Thai Gross National Product through an extension of resource exploitation;

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1. The use of the dynastic name, 'Rama', for kings of the ruling Chakri dynasty is perhaps less familiar than other terms. Rama IV is usually known in the West as King Mongkut.

2. Hoselitz,B.F., "Patterns of Economic Growth", Canadian Journal of Economic and Political Science, vol.XXI, 1955.

3. Muscat,R.J. "Development Strategy in Thailand", New York 1966, p.19.

'satellitic' indicates a dependence on outside influence; while, conversely, 'autonomous' describes the tendency of the Thai government to intervene in the process of development to only a minimal extent.

This description does seem to be essentially valid for the Thai economy as it developed in the late nineteenth and early twentieth centuries. The economy came to be dominated by a narrow range of export crops. In each case, the government stood aside to allow investment from external sources to tap hitherto unrealised resources within the kingdom. In the northern hills, the British exploitation of the teak forests of Burma spilled over into Thailand and, after some disagreements, understanding was reached on the licensed felling of the Thai forests. In the southern peninsula, British and Australian capital expanded and modernised the existing small-scale tin-mining industry which had first been developed by local Chinese entrepreneurs. At a later date it was Chinese capital and initiative which extended rubber cultivation from Malaya into the southern states of Thailand.

In the Central Plain of the country too, the development of paddy rice cultivation which was to become the basis of the nation's export economy was also initially in the hands of foreign entrepreneurs. Not only did European traders control the rice trade out of Bangkok,[4] but they also acted as advisors in most of the government departments involved in the trade. It was as a result of European developments elsewhere that the demand

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4. Silcock,T.H. "Economic Development of Thailand", Chapter 1, in Silcock,T.H. (ed), "Thailand: Social and Economic Studies in Development", Canberra 1967, p.4.

for Thai rice expanded, especially with the institution of regular steamship services to Bangkok and the opening of the Suez Canal in 1868. The demand came from many sources. Silcock notes

> "It is clear that the chief source of the expansion was the increasing demand for Thai rice, generated partly by the impact on Southeast Asia of demand from other parts of the world than the traditional market in China - markets in Europe in Africa, a newly industrialised Japan and new rice-deficit plantation economies in the Netherlands East Indies, British Malaya and Ceylon." 5

As Ingram warns however, the origin of the demand is less easy to explain. Statistics of rice exports from Thailand reveal that the bulk of Thailand's exports went to the entrepots of Singapore and Hong Kong for consignment to other countries.[6]

As the external demand for rice increased, the area of land under paddy expanded rapidly. It was not that the Central Plain was exceptionally well-favoured for paddy cultivation, nor were the communications by waterway as extensive as those of the neighbouring Irrawaddy plain of Burma. The Chao Phraya river was subject to extreme variations of flow, having no regulatory snow-melt regime common to the other major rivers of monsoon Asia, and frequent floods and droughts hindered both cultivation and navigation. For this reason, the construction of railway lines and the excavation of regulatory canals were very important in influencing the rate and direction of expansion. Canal systems like the Rangsit scheme of the 1880s were most important to the expansion of cultivation in

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5. Silcock,T.H., "The Economic Development of Thai Agriculture", Ithaca 1970, pp.37-38.

6. Ingram,James C., "Economic Change in Thailand 1950-1970", Stanford 1971, pp.41-43.

the lower part of the Central Plain, but the railways, built mainly as a means of consolidating Thailand's hold on her outlying provinces, helped to push export-oriented paddy cultivation into the more marginal areas.

The extension of paddy cultivation took place with no perceptible change in techniques from the age-old methods practised by the Thais and this led to a long-term decline in yield, which may be traced from the early 1920s. (Figure II-1) According to Ingram, the decline in yields took place primarily in the outer provinces and was

> "..predominantly influenced by the trend in the Northeast." 7

This is illustrated in Table II-1. Nevertheless the area of paddy in the Northeast increased from an annual average of about 3.9 million rai in 1920-24 to over 12 million rai[8] in 1948-50. Despite the extension of irrigation facilities in the Central Plain, where the construction of the South Pasak scheme in 1924 and the Chiang Rak - Khlong Dan project in 1931 produced an upturn in yields, the national decline in yields continued until 1947.

After the Second World War in Southeast Asia, the Thai economy, still dominated by its four major export crops of rice, rubber, tin and teak, seemed essentially buoyant. The export markets for teak and tin soon recovered; the rubber industry had received a wartime boost from the disruption of the Malayan production and was further stimulated by the demands of the Korean war; the rice trade, despite the call for war

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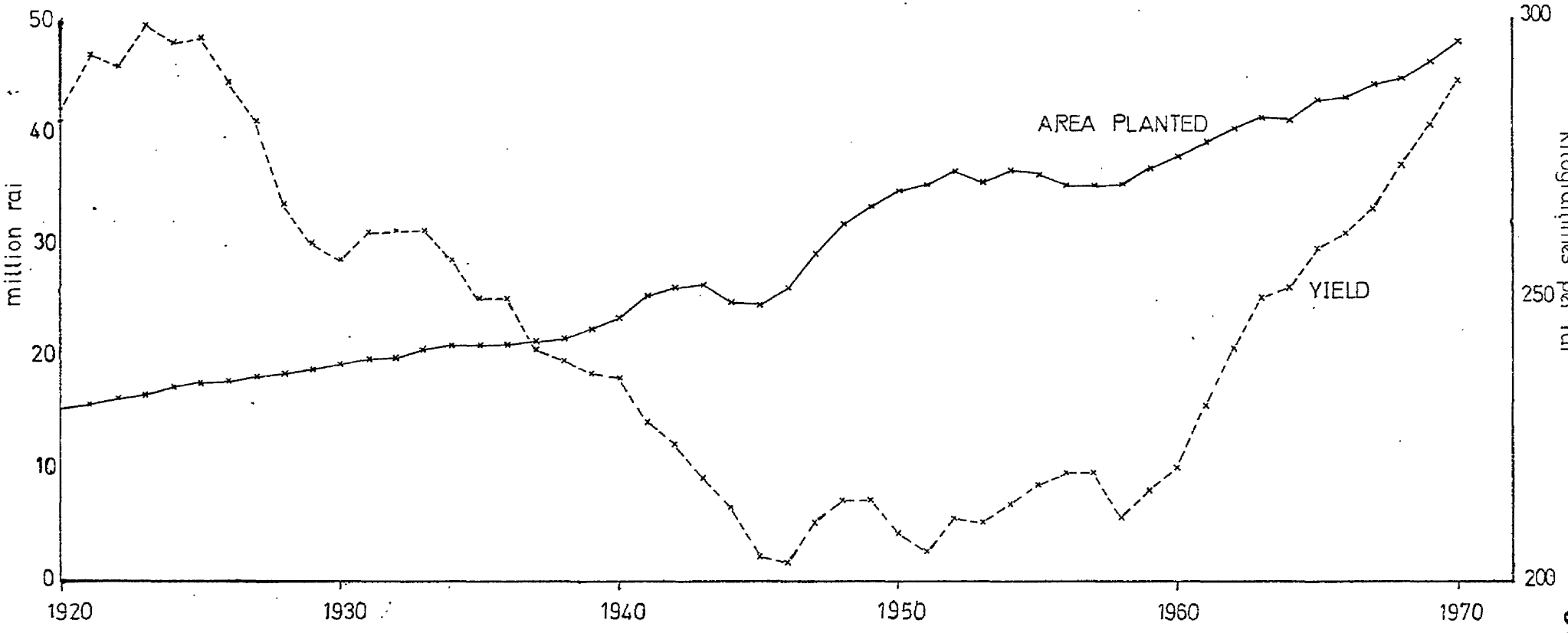
7. Ibid., pp.49-50.

8. 1 rai = 0.4 acres = 0.16 hectares. See glossary of Thai measures.

FIGURE II-1: THAILAND - RICE AREAPLANTED AND YIELD 1920-1970



Source : Ministry of Agriculture, Annual Rice Reports

TABLE II - 1

Thailand : Rice Yield By Region

	Centre	Outside Centre (Piculs Per Rai)	Northeast
1921-24	4.24	4.90	4.30
1930-34	3.91	3.90	3.22
1940-44	3.37	2.95	2.54
1948-50	3.90	2.88	2.47

Source: Ingram, J.C. "Economic Change in Thailand 1850-1970". Stanford 1971, pp. 49-50.

reparations in kind, also benefited from the chaos which reigned in other rice-exporting nations, notably Burma where war damage had been followed by a savage civil war. Moreover Thai rice production proved itself capable of meeting the demands of the world market. Although the planted area continued to expand, the continued increase in production was also brought about by an upturn in the yield per rai throughout the kingdom. In this respect, the development of further large-scale irrigation and water control projects in the Central Plain, notably through the completion of the Chao Phraya diversion dam at Chainat in 1956, helped to reverse the former downward trend, but throughout the kingdom the adoption of new improved seeds, the use of chemical fertilisers and the spread of better cultivation practices also helped improve per unit area yields.[9]

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9. In fact the depression which followed the end of the Korean War did affect the Thai economy to the extent that the government had to introduce substantial financial reforms including the devaluation of the baht and the replacement of the post-war government rice trading monopoly with a system of export taxes, notably the rice premium. The role of this latter in the economy of Thailand since its introduction has been a subject of prolonged debate. It is argued that it has the effect of depressing farm-gate prices as the merchants compensate for the tax by increasing their margins lower down the marketing chain. It certainly raises the price of Thai rice on the international market to a par with those of other exporters while helping to depress prices internally for the benefit of the urban (Bangkok) consumers. On the other hand it does give the government a method of manipulating the trade to prevent internal shortages and to control price fluctuations. For a fuller discussion of the whole mechanism of the premium see:-
Silcock,T.H., "The Rice Premium and Agricultural Diversification", in Silcock,T.H.(ed.) op.cit.,pp.231-257, and Sura Sanittanont, "Thailand's Rice Export Tax: Its Effects on the Rice Economy",Ph.D. (Economics) Thesis, University of Wisconsin, 1967.

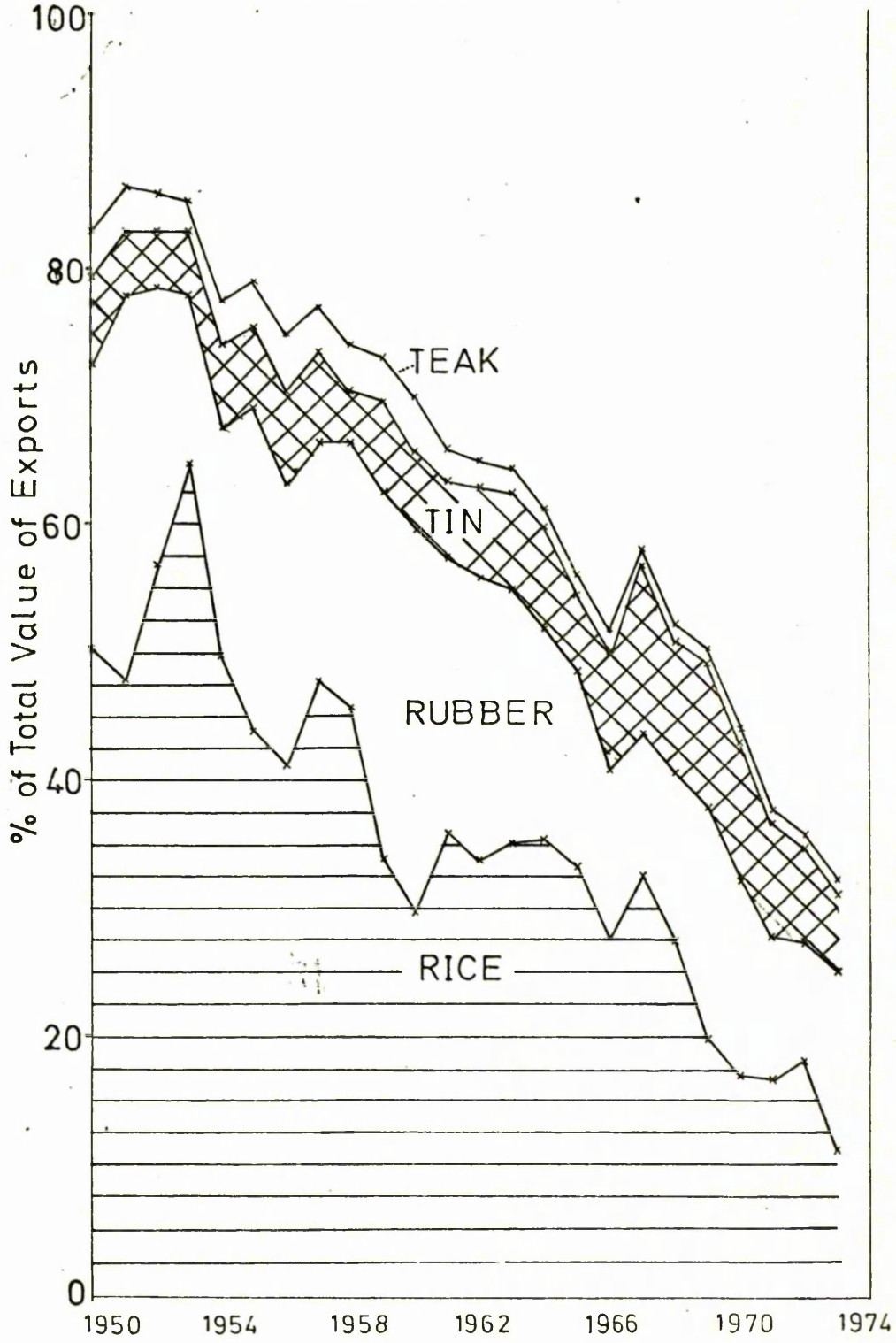
As Figure II-2 demonstrates, in the immediate post-war years the four traditional commodities of rice, rubber, tin and teak still dominated Thai exports by value. Between them they accounted for 83.1% of the total value of exports in 1950; despite the steady expansion of maize and cassava exports moreover, this situation was maintained ten years later when the same products still contributed 70.1% of exports by value. If at this time the country's second export, rubber, was under increasing pressure from the higher-yielding stock of Malaya, as well as from synthetic supplies, the staple rice trade seemed in a favourable position. In 1950, rice still contributed over half the value of the country's exports; by 1965 the proportion was still as high as one-third, despite the emergence of many new exports of which maize, cassava and kenaf were the chief. In a climate of apparent continued shortage of grain on the world market, the opportunities for the progressive expansion of a Thai economy based on rice exports seemed particularly good.

In the early 1960s, the statement of neo-Malthusian views by the world organisations encouraged a further expansion of planted area and the development of irrigation for second cropping of rice, both in the Central Plain and in the river basins of the dry Northeast. Typical was the observation of the F.A.O.:

> "Despite the substantial progress made in rice cultivation since 1950....doubts have been raised by the recent slowing down in the rate of growth. On a per capita basis, indeed, supplies available have shown little improvement for five years....
>
> "While some of the recent setbacks are due to short-term failures, it seems certain that the world will not be able to grow enough rice

FIGURE II-2

THAILAND : % CONTRIBUTION OF FOUR TRADITIONAL PRODUCTS TO TOTAL VALUE OF EXPORTS 1950-1973



Sources : Ingram (1971) and Bank of Thailand Monthly Bulletin

> to satisfy its needs unless full use is made of available resources. 10

Unfortunately, in the last few years, the position of Thailand's agriculturally based economy, heavily dependent on a few primary products and particularly upon rice exports, has appeared much less favourable. It is true that she has broadened the base of that economy over the last decade so that by 1972 manufacturing accounted for as much as 16.8% of the national G.D.P., and even in the agricultural sector, crops like maize, cassava and kenaf have continued to grow in importance. Despite these developments, however, the whole economy has remained dangerously unstable, as, particularly since 1970, the market for the majority of Thailand's primary agricultural products has become exceedingly unstable.

It has been the violent fluctuations in the staple rice trade which have been at the heart of these problems, affecting in due course the whole economy. From as early as 1968, far from being able to get rid of all her surplus rice to hungry food-deficit nations, Thailand found that she had to struggle to sell, even at low prices or on concessionary terms. This difficulty was brought about by a combination of two factors, one of which assumed an increasing importance over a decade or more, the other a phenomenon of more immediate origin.

The long-term factor was the rise of rice exports from new sources in response to food shortages. As Virach observed

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10 Food and Agriculture Organisation, "The State of Food and Agriculture 1966", especially Chapter IV, "Rice in the World Food Economy. Situation and Outlook in the International Rice Year", Rome 1966, p.185.

> "The pattern of the world's rice trade changed substantially during 1951-65. The total volume of the world's milled rice trade increased from 4,978,000 metric tons in 1951 to 7,390,000 metric tons in 1969, equivalent to a 49% increase. Thailand's share of the world's rice trade decreased from 33% in 1951 to 27% in 1965, while during the same period, Burma, its principal rival rice exporter in Southeast Asia decreased its trade also from 26% to 18%..... The United States' exports rose from 10 to 21 percent, while those of Mainland China rose from 3 to 12 percent." 11

In addition to the rise of rice exports from the United States and the Peoples' Republic of China, competition came also from other sources. Egypt began to export increasing quantities of rice; Japan turned from a net importer of rice in 1967 to a net exporter with substantial surpluses which were being offered on concessionary terms; exports from European producers, notably Italy and Spain also expanded with the assistance of export subsidies within the European Economic Community. (Figure II-3)

While the world trade in rice was expanding, as in the period 1951-65, and the world shortage of grain persisted, the entry of these new exporters on the scene did not make any appreciable difference to the traditional exporters. In 1964, Thailand had its record export of rice in terms of volume with a total of 1,896,000 tonnes sent abroad; in 1967, although volume was lower, the higher world market price gave Thailand her record rice exports by value, 4,653 million baht. However, by the following year, the second factor responsible for the new problems besetting the Thai rice economy was making its presence felt.

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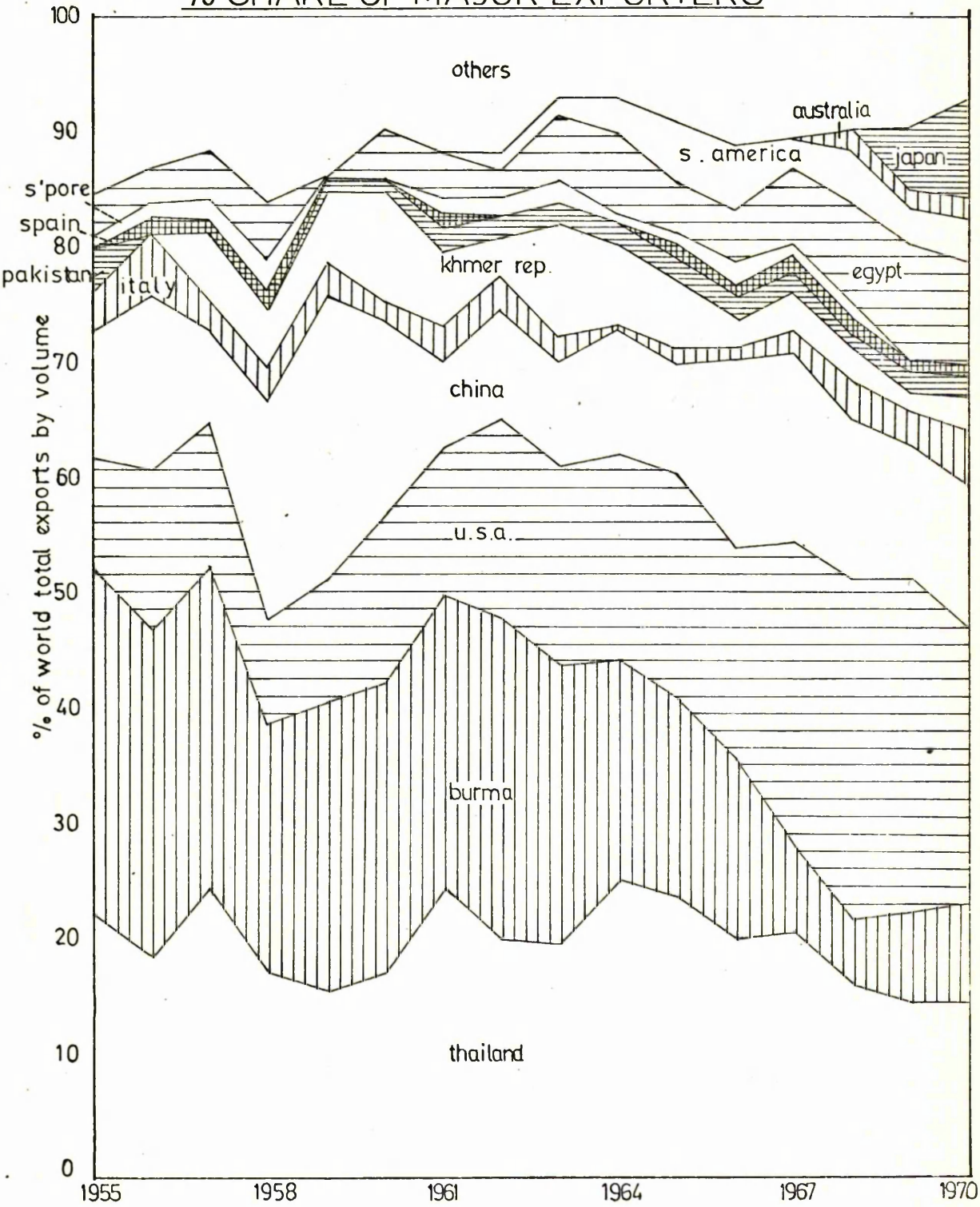
11. Virach Arromdee, "Rice Economy of Thailand", Thailand Development Report, vol.4, January 1969, pp.3-4.

FIGURE II-3
WORLD RICE EXPORTS
% SHARE OF MAJOR EXPORTERS



Source : F.A.O Trade Yearbook

By 1968, the effects of the so-called 'Green Revolution' were manifesting themselves in the performance of the agricultural economy of many food-importing countries of Asia. The introduction of new strains of grain, primarily the Mexican wheats and the famous 'miracle' rice seeds developed at the International Rice Research Institute at Los Banos in the Philippines, along with the increased application of fertilisers and pesticides meant that many of the traditional rice-importing countries reduced their imports dramatically over the period of a few years. Figure II-4 demonstrates that the trend of production in almost every major rice-growing country was steeply in the ascendent. In many countries, the 1970 production was an all-time record crop. The F.A.O. Rice Report for 1971 noted:

> "Record crops were harvested in Ceylon, India, Indonesia, Malaysia and the Republic of Vietnam." 12

Of the countries of Southeast Asia, only the Philippines and the Khmer Republic had any rice production problems in 1970, the former hit by severe typhoons, the latter by bad weather and growing political turmoil. Elsewhere in the world, the falls in production in Japan and the United States were a result of policy measures by the respective governments in response to the poor market situation.

It appeared likely that the situation reached in 1970 was by no means a temporary phenomenon. The overall trend in all the major rice-producing countries in Asia, as shown in Figure II-4, is undoubtedly upward, with the exception of the

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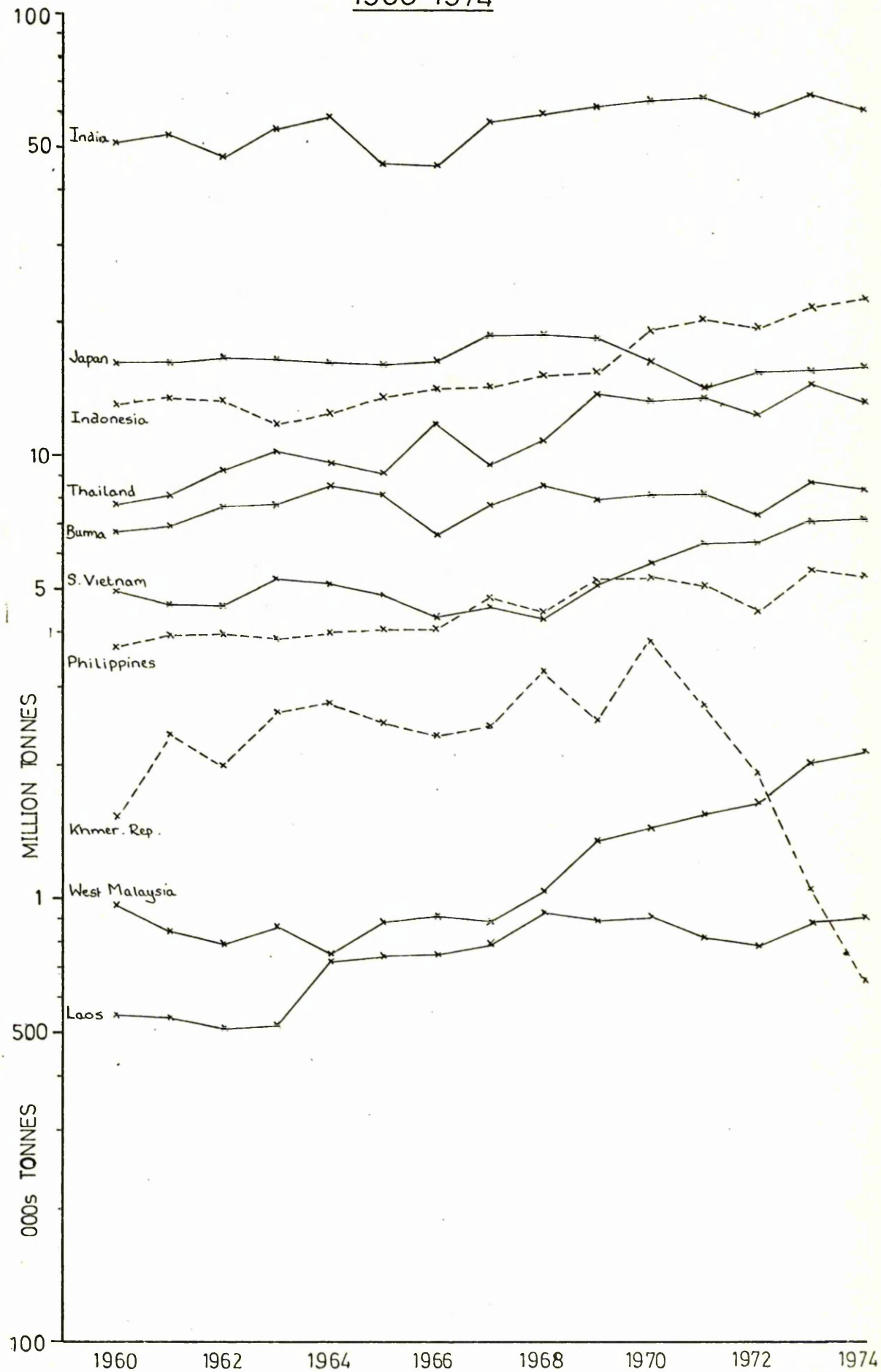
12. Food and Agriculture Organisation, "F.A.O. Rice Report 1971", Rome 1971, p.5.

FIGURE II-4

PADDY PRODUCTION: MAJOR ASIAN PRODUCERS 1960-1974



Source : F.A.O Production Year book

war-rent nations of Indochina.[13] The threat to Thailand's traditional markets seemed very clear. As Figure II-5 illustrates, the volume of rice exports reached only marginally over one million tonnes in each of the years 1968-1970 and the value of exports dropped steadily from its record 1967 level. Rice's share in total exports

> "...was about 27.6% in 1968, but fell sharply to 20.0% in 1969. Actually in 1969, the quantity of rice exported was only 4.2% less than in 1968, but the export value decreased sharply by 22.0%...The situation deteriorated further in 1970." 14

This crash in the value of rice exports meant that during the period 1967-70, the total value of Thailand's export trade completely stagnated.

By 1971 the situation had become extremely serious. The Bangkok Post voiced the worries of the people as further evidence of the problem came to light. In May of that year it noted that the head of the rice distributing agency of Indonesia had confirmed

> "...that Indonesia has stopped buying commercial rice from Thailand and Burma...,.....most of the rice which comes to Indonesia was under the American PL-480 food aid program." 15

There was competition from Asia as well:

> "Japan....managed to sell 200,000 tons of rice to Pakistan this year under long repayment terms, and, not surprisingly, Pakistan declined to purchase rice from Thailand during the year." 16

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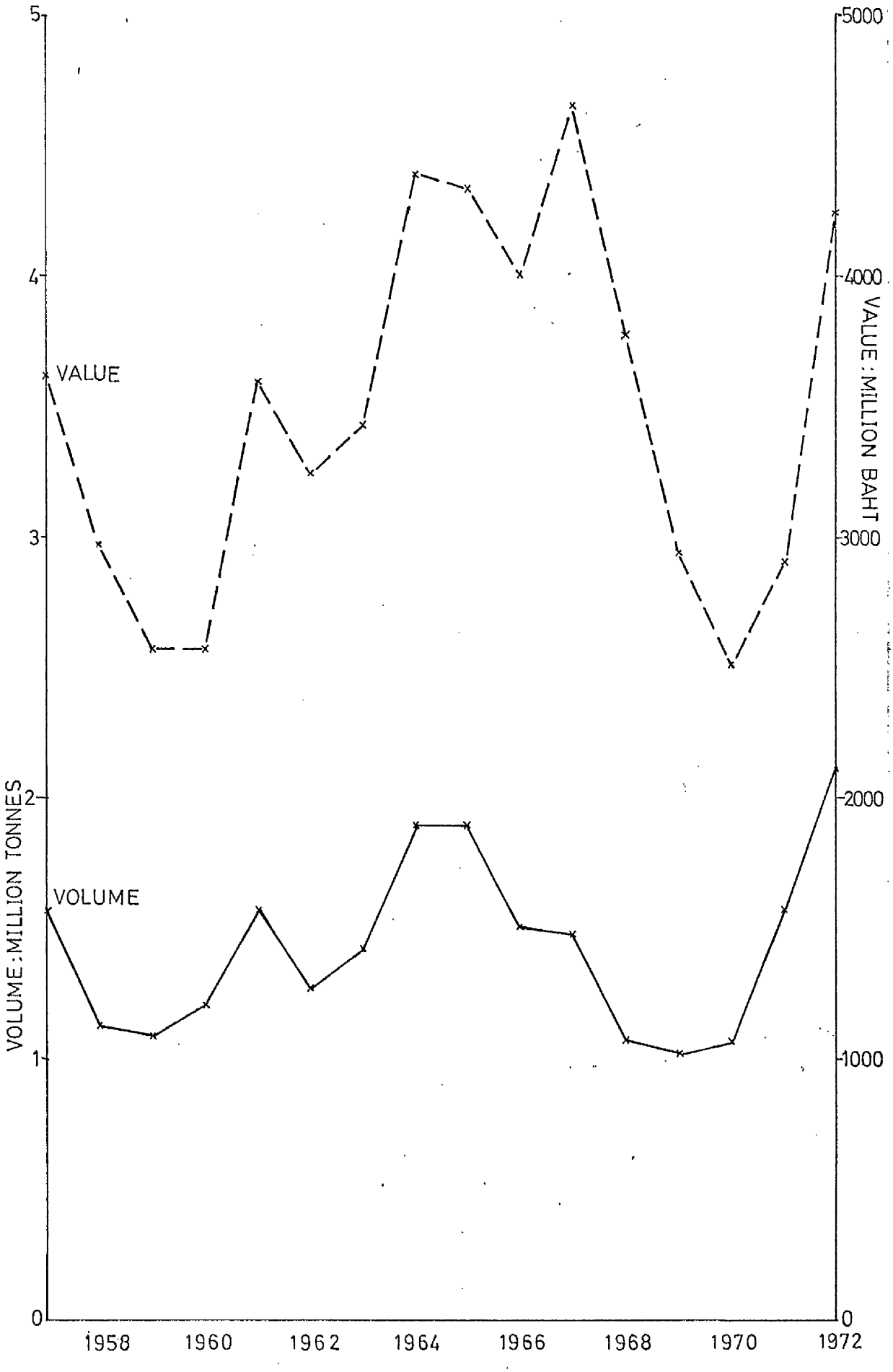
13. The cessation of hostilities in Indochina in 1975 seems likely to produce an eventual upturn in Laos, Cambodia and Vietnam too.

14. Economic Commission for Asia and the Far East, "Economic Survey of Asia and the Far East,1970",Bangkok 1971, p.307.

15. Bangkok Post, 10th May, 1971.

16. Ibid., 12th April, 1971.

FIGURE II-5
THAILAND : RICE EXPORTS - VOLUME AND VALUE
1957 - 1972



Source : Bank of Thailand Monthly Bulletin

Most of Thailand's traditional markets had increased production:

> "For the first time in 8 years, South Vietnam will have an export surplus." 17

and even the glutinous rice market was shrinking:

> "Laos, formerly the best customer for this type of rice, is becoming more nearly self-sufficient." 18

In these circumstances, drastic measures were needed to restore the situation. Exports in the first quarter of 1971 were 39,000 tonnes down on the same quarter of 1970 and prices at the farm gate had crashed to around 0.4 baht per kilogramme.[19] Farmers were reluctant to sell their rice and the rice barns were full to capacity. Faced with this situation, the Thai government did indeed take measures to stimulate exports. In April 1971 the export premium was abolished on all rice grades of 10% and lower and the following month this was extended to the top grades, 100% and 5%.[20] This had the effect of both raising the local prices and lowering the export prices of Thai rice, making it more competitive on the world market and encouraging the country's rice producers to make supplies more readily available.[21] At the same time, rice was also offered

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17. Ibid., 22nd June, 1971.

18. Ibid., 12th April, 1971.

19. Previously the price had been fairly constant around the 1.0 baht per kilogramme mark.

20. Rice is graded according to the percentage of broken grains, except for the highest grade which is 100% unbroken.

21. Usher has drawn up a table suggesting that, whereas a farmer receives only 46% of the total rice export price f.o.b., at the time of his comment, the rice premium made up 38% of the total price. See Usher,D., "The Thai Rice Trade" in Silcock,T.H. (ed), op.cit., p.221 and footnote 9 above.

on long-term credit terms to countries short of foreign exchange and the government became much more active in arranging export contracts direct with other governments. The contract to export 50,000 tonnes to the Philippines on twelve-year credit was the first sale of this type to be made by Thailand.[22] By the end of the year, rice exports, stimulated by these measures had risen to nearly 1.6 million tonnes of which 38.8% had been under government contract, compared to 32.7% in the previous year.

These measures were highly successful in pushing Thai rice on the world market and in 1972 demand had grown to such an extent that, anticipating the effect of drought conditions in parts of the kingdom on the new crop, by September export premiums had to be re-imposed to prevent a shortage within Thailand. Exports in 1972 nevertheless totalled a huge 2,107,000 tonnes, with a total value once more over 4,000 million baht.

The drive to increase the rice export volume in 1972 resulted in the extensive depletion of the country's rice stocks. At the same time, the previous year's drought conditions had, as the government had anticipated, severely affected rice production. The main season crop dropped to a mere 11.67 million tonnes of paddy. The poor conditions in Thailand were, moreover, echoed in many of the other countries of Monsoon Asia. Production fell back in Burma, China, India, the Philippines, Sri Lanka and the increasingly war-affected Khmer Republic. Increased production in other parts of the world did not compensate for the downturn in Asia and the

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22. Bank of Thailand, Monthly Review, July 1971, p.9.

external demand for Thai rice remained high throughout 1973.

In Thailand itself prices moved rapidly upward throughout late 1972 and 1973 as world demand coincided with domestic shortage. Far from having to struggle to sell her surplus, Thailand was faced only a year later with a completely contrasting situation. A strict control was imposed on the rice trade and over the period June 12th - July 30th 1973, a complete ban on exports was temporarily enforced. Although the ban was short-lived, controls continued right through to November and the year's export volume fell to only 850,000 tonnes. The new crop promised to bring some relief to the situation. Stimulated by the rise in prices and encouraged by government exhortations, Thai rice farmers had produced their biggest ever dry season crop in 1973, estimated at some 0.8 million tonnes. Despite some poor weather again in the Northeast region, the following main season crop shot up to a record 13.90 million tonnes.

Even so, 1974 saw a continuation of the difficult conditions of 1973 in Thailand. Now the chief cause of the difficulties was the still high level of demand in the world market as various countries sought to replenish stocks depleted after the disastrous 1972 season. In early 1974 prices moved rapidly above their 1973 levels in Thailand and on the world scene and measures had to be taken to make exports less attractive. The rice premium was raised twice in the first quarter of 1974 and private export quotas were reduced in order to prevent a domestic shortage.

Yet the volatility of the whole situation was such that, by June the Thai government was reducing the premium and increasing export quotas once again. Already the world demand had slackened and falling prices were further depressed by the

arrival on the home market of the dry season crop of about 1 million tonnes. Once again Thai rice was beset by competition from less expensive supplies from the United States and from China, the latter granting subsidies to customers in order to maintain their markets. Further reduction in the premium and other adjustments were made by the government in October and December 1974 in an effort to stabilise prices and maintain exports, but, despite these attempts, the situation appears to have changed fundamentally. In early 1975 prices were falling once again.

The convulsions in the Thai rice trade over the period 1970-74 have been described in some detail in order to demonstrate the difficulties to be encountered if great reliance continues to be placed on rice as the staple foreign exchange earner. It is true that 1974 saw earnings from rice exports of as much as 10,000 million baht, but this should be set against inflation and as was noted as early as March 1974

> "Rice exports should revert to normal by 1975."[23]

Nor does it appear that the conditions of high prices and large external demand which favoured rice exports in 1974 were more than a temporary aberration to the trends noted earlier. In 1974 decreased production in exporting countries was offset by favourable production in many importing countries, where the high prices had stimulated a new drive towards self-sufficiency. The F.A.O. noted that, for example,

> "In Malaysia, the government decided to raise its self-sufficiency target from

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23. Bangkok Bank Monthly Review, vol. 15(3), March 1974, p.179.

> 90 to 100 percent, and will develop new areas for rice cultivation in the next few years." 24

It cannot be expected that, after the traumatic experience of recent years, such policies will be easily reversed. Since at the same time exporters in the temperate zone have once again increased their acreages allotted to rice,

> "it is..likely that Thai rice trading prospects..may not be very bright." 25

Longer term forecasts are equally pessimistic. Despite the chaos of 1973-74, the findings of a study on the projected demand for and production of rice up to 1980 summarised by the F.A.O. in 1971 still seem valid. Allowing for increases in production in most developing countries, but for a cutback in the United States and Japan, and balancing overall population increases with a reduction in consumption in such countries as Japan and Taiwan, the study forecasts a substantial excess of supply over demand by 1980. Although it is admitted that even this depends on stability in Vietnam and the Khmer Republic, the general conclusion is that

> "..the long-term trend for the world rice trade to represent a smaller fraction of the world production will continue in the future. Also, the current tendency for the export supplies to increase faster than commercial export outlets is likely to continue over the next decade. A further demand would probably lead to an increasing recourse to subsidies and an expansion of concessional deals." 26

In this way Thailand now faces the problem which has beset

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24. F.A.O., "F.A.O. Rice Report 1974/75", Rome 1975, p.12.

25. Bank of Thailand Monthly Bulletin, vol.XV(1), January 1975, p.14.

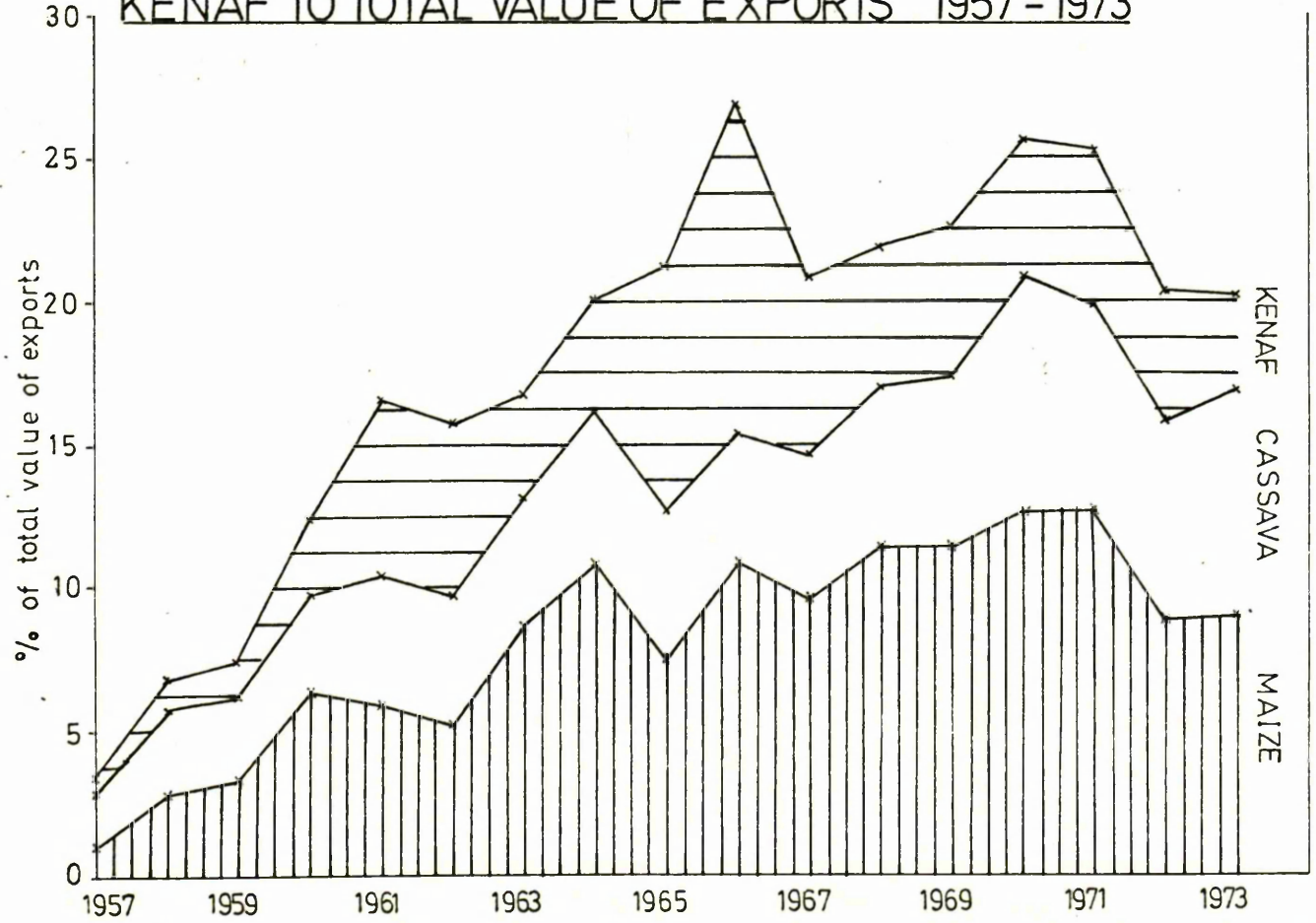
26. F.A.O., "F.A.O. Rice Report 1971", Rome 1971, p.24.

many colonial, 'satellitic' economies in the developing world. Perhaps Thailand is being presented with this problem rather later than some other countries; for some decades the great world demand for food grains has drawn attention away from the narrow base of the economy, with its basic dependence on rice exports. If the F.A.O. forecasts are correct, Thailand is sure to find greater difficulty in selling its rice in the next decade, during which period it is likely that her potential rice surplus will be maintained or will increase as more farmers adopt new rice strains and new methods of cultivation -- and this despite a continuing high rate of population growth.

To compete on the world market, Thai rice must be produced as cheaply as possible, mainly in those areas best suited to its cultivation, namely the great fertile tracts of the Central Plain. Elsewhere the country should be seeking, as indeed it is, to reduce its dependence on a narrow range of export crops. This can be achieved by the development of export industries or by the diversification of the agricultural base. While it may be true that there are possibilities of industrialisation in selected localities within the country, generally the second alternative would appear to be more favourable. Already maize, cassava and kenaf have risen to a prominent position in export earnings and indeed the first two prospered alongside rice in the situation of world grain shortage in 1973-74. Both have now to some extent overcome the problem of a narrow market, dominated originally in the case of maize by Japan and Taiwan and in the case of cassava by the Netherlands and West Germany. They continue to prosper with the feed grain market maintaining its buoyancy and constituted the country's third and fourth largest exports by value in 1974. (Figure II-6).

FIGURE II-6

THAILAND : %CONTRIBUTION OF MAIZE, CASSAVA AND KENAF TO TOTAL VALUE OF EXPORTS 1957 - 1973



Source : Bank of Thailand Monthly Bulletin

The prospects for maize and cassava are, however, not entirely favourable and those for kenaf probably much less so. All three crops have been developed mainly in upland areas, sometimes on extremely steep slopes, sometimes on soils of rather poor fertility. It can be expected that problems of soil erosion or soil exhaustion will arise from continuous cultivation of such areas, particularly in the hills where the crests of ridges have been denuded of protective forests. Kenaf, moreover, throughout its development, has been subject to violent fluctuations in export quantity and value; its best years have coincided with climatic or political disruption of jute production in Bangladesh and India and its instability has made it progressively less popular with Thai farmers.

In terms of land-use, these new crops represent an extension to the pattern rather than a change within the existing pattern. Large areas of essentially low productivity in rice continue to be planted with that crop as the best insurance policy in the present conditions. Large areas of paddy land of this type could be used to the greater benefit of the owners and of the country as a whole. This is particularly so in the Northeast region, where relative isolation and physical conditions in general do not favour commercial rice cultivation except in the major river valleys. For this reason, the Northeast, drawn into the Thai kingdom at a relatively late date, has been less able to take advantage of the commercial possibilities so far offered in the history of Thai development. Even the introduction of upland cropping of cassava and kenaf has not notably improved its position and is subject to the doubts expressed above. Yet the region is

capable of making a greater contribution to the Thai economy. Great possibilities have been seen for livestock rearing on the higher lands, while the development of a number of irrigation projects in the last two decades has offered the promise of mixed cropping replacing and/or supplementing paddy cultivation in the lower areas. These prospects and the extent of the problems which hinder their realisation will now be examined in greater detail.

II : The Northeast in the Thai Economy

Recent trends in world trade have emphasised the need for Thailand to diversify her export economy at the national level. At the regional scale, the need for diversification is nowhere more conspicuous than in the Northeast region of the country. Since its incorporation into Thailand in the early nineteenth century, the Northeast[27] has continued to be a problem area, both economically and politically. Until the early 1960s, the economy of the region was almost totally dependent on the cultivation of rice and the rearing of livestock on a semi-subsistent basis. Commercialisation was slow to penetrate the area and farmers had a tentative commitment to the market only in years of surplus. Zimmerman noted in 1931 that the per capita income level in the Northeast region was only 34.1% of that of the country as a whole[28] and this position has not improved markedly since that time. While it is probable that both Zimmerman and modern commentators underestimate the income levels of Northeast families by neglecting the fact that the proportion of the farm family's requirements furnished by its own subsistence production is higher than in other regions of the country, this large gap in income levels certainly does exist.

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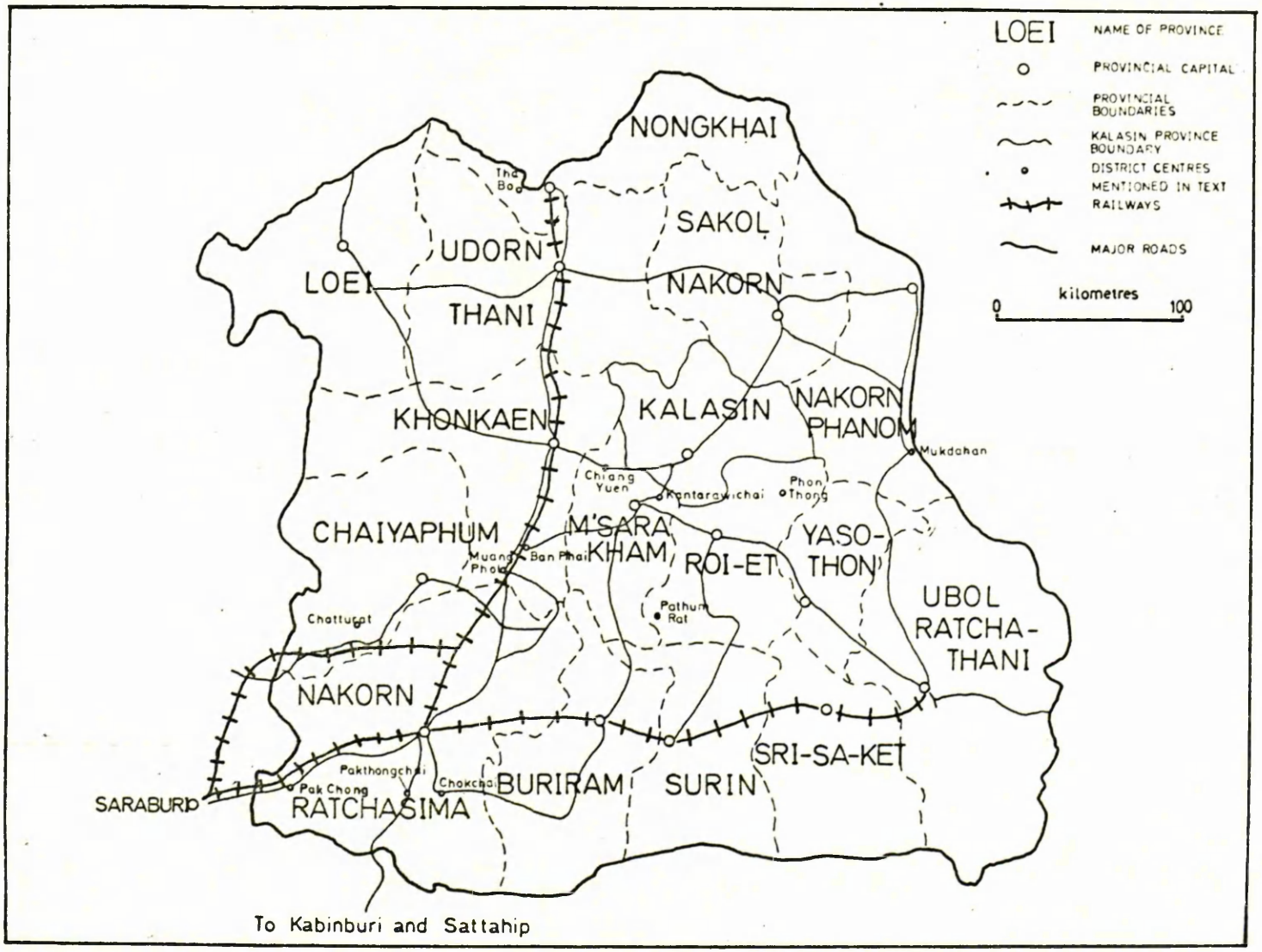
27. The Northeast constitutes the 16 provinces of Kalasin, Khonkaen, Chaiyaphum, Nakorn Phanom, Nakorn Ratchasima, Buriram, Mahasarakham, Yasothon, Roi-et, Loei, Sakol Nakorn, Sri-sa-ket, Surin, Udorn Thani, Ubol Ratchathani and Nongkhai. (Figure II-7).

28. Zimmerman,C.C., "Siam Rural Economic Survey 1930-31", Bangkok 1931, p.48.

FIGURE II-7

NORTHEAST THAILAND : ADMINISTRATIVE AREAS AND COMMUNICATIONS



Moreover it would appear that this gap is gradually widening. National income statistics in Thailand have only been available since 1960 and the original estimates have been revised more than once since the figures were first published. Nevertheless all the estimates point to the same trend. According to revised estimates as used by Phisit, in 1960 the per capita Gross Domestic Product for the whole kingdom was 2000 baht; at the same date the per capita G.D.P. for the Northeast region was only 1076 baht.[29] By 1969, although according to yet further revised estimates the Northeast average had risen to 1634 baht, this was only 46.3% of the national G.D.P. level.[30] Since 1970 only provisional estimates are currently available, although these do suggest that the downward trend in the Northeast has been halted, at least temporarily. (Table II-2).

Thus, although Northeast Thailand constitutes 33% of the total land area of the country and although its population of over 13 million comprises approximately 35% of the national total,[31] the region's contribution to the nation's total wealth is disproportionately low. Taking once again revised figures, in 1969 the Northeast's contribution to Thailand's gross

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29. Phisit Pakkasem, "Thailand's Northeast Economic Development Planning; A Case Study in Regional Planning", N.E.D.B., Bangkok 1973, Table 2-1,p.27 and Table 2-7,p.42.

30. National Economic and Social Development Board, "National Income of Thailand,1972-73 edition, volume 6, The Economy in 1973 viewed through Gross Regional Product.", Regional Accounts and Data Analysis Unit, National Accounts Division, Bangkok 1974, Table B-1,p.3 and Table 1,p.6.

31. Estimated from the census figure of 12.023 million, 35.2% of the national total given in National Statistical Office, "Thailand Statistical Yearbook No.29,1970-71", Bangkok 1972, Table 12,p.37.

TABLE II - 2

Per Capita Income Levels 1960-73 (Baht) Whole Kingdom & Northeast Region

Year	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Whole Kingdom	2000	2106	2207	2277	2416	2635	3072	3165	3323	3578	3613	3738	3986	4530
Northeast Region	1076	1125	1167	1209	1161	1318	1620	1486	1663	1749	1627	1735	1927	2143
% Northeast of Whole Kingdom	53.80	53.42	52.88	53.14	48.05	50.02	52.73	46.95	50.05	48.49	45.03	46.42	48.34	47.31

Sources: Phisit Pakkaum: Thailand: Northeast Economic Development Planning: A Case Study in Regional Planning, Bangkok 1973

and N.E.S.D.B. "National Income of Thailand" 1972-73 Edition: "The Economy in 1973 viewed through Gross Regional Product: Bangkok 1974

domestic product was 16.0%, a fall from a percentage of 18.0% over the ten years. Although the G.D.P. of the area did show an increase over the period of 78.2%, this was more than offset by the advance reported for the other regions of the country, particularly for the Central Plain where G.D.P. rose by 114.7%. (Table II-3). More recent estimates suggest that, in this respect, the Northeast region is still dropping further behind the rest of the country.[32]

This steadily worsening position has come about despite a formidable amount of public investment which has been poured into the region over the last decade. Under the First and Second National Economic Development Plans, the Northeast received a total budget of about 19,500 million baht. This constituted 27.8% and 27.9%[33] respectively of the total budget of those two plans and was therefore not in proportion to the Northeast's share of the national population, but in terms of the amount of government revenue received from the region, it represented a large-scale transfer of resources into the Northeast. In addition, the construction of a series of United States Air Force bases in Northeast Thailand in connection with the Indochina war has also pumped a large amount of capital into the region.

This investment has been channelled mainly into the creation of capital infrastructure for the region, notably in the improvement of communications[34] and in the construction of a

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32. National Economic and Social Development Board, op.cit., Table B-2, p.4 and Table 2, p.7.

33. Phisit, op.cit., Table 2-8, pp.50-51.

34. Some of the communications facilities are likewise connected with national defence in the context of the Indochina war.

TABLE II - 3

Gross Domestic Product By Region (Billion Bant: Constant 1962 Prices)

Increase & Change in Regional Share 1960-69

A. Increase	Whole Kingdom	Central Plain	North	Northeast	South
1960	56.0	29.2	8.9	10.1	7.9
1969	112.6	62.7	17.0	18.0	14.7
Net Increase	56. 6	33.5	8.1	7.9	6.8
% Increase	101.1	114.7	91.7	78.2	86.1
B. Share					
% 1960	100.0	52.0	15.9	18.0	14.1
% 1969	100.0	55.7	15.2	16.0	13.1
% Change		+ 3.7	- 0.7	- 2.0	- 1.0

Source: Phisit Pakkasam: op.cit.

number of major dam projects, both for irrigation and flood control and for electricity generation. As Table II-4 demonstrates, transport accounted for 32.6% of the regional budget under the first plan and 34.2% under the second plan; irrigation facilities were allotted 9.1% and 8.5% respectively. Other prominent sectors were in social services; education, public health and public welfare projects received in total 48.6% of the first plan budget and 48.3% under the second plan.[35] By concentrating investment into these sectors, the Thai government clearly hoped to create the conditions to stimulate the rural economy of the Northeast. Unfortunately, although the regional economy grew at about 7.0% per annum between 1960 and 1969, roughly the period of the first two development plans, this growth was concentrated very much in those sectors in which there had been direct investment.

As Table II-5 shows, with the exception of the rapid growth in the previously undeveloped mining and electricity sectors, the chief growth sectors in the Northeast economy do correspond closely to the division of investment under the development plans and with the presumed effect of American spending. Banking and allied services underwent rapid development from a low level; construction expanded at an annual rate of 16.8%, reflecting the work on the major dams and on the air bases; transportation and communications grew at 11.5% in line with investment in that sector. By contrast, agriculture, the dominant sector in the economy, contributing 46% of the gross regional product in 1969, grew only slowly

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35. Phisit, op.cit., Table 2-8, pp.50-51.

TABLE II - 4

Budget Distribution of National Economic Plans - Northeast Region

	First Plan		Second Plan		Third Plan	
	Amount (Million Baht)	%	Amount (Ml. Baht)	%	Amount (Ml. Baht)	%
Agriculture						
Irrigation	590	(9.1)	1102	(8.5)	914	(4.9)
Crop Research & Ext.	137	(2.1)	250	(1.9)	496	(2.7)
Forestry, Livestock, Fishing	253	(3.9)	332	(2.6)	579	(3.2)
Other (a)	107	(1.6)	187	(1.4)	198	(1.1)
	1087	(16.7)	1871	(14.4)	2187	(11.9)
Industry, Mining Commerce (b)	2	(0.0)	10	(0.1)	138	(0.7)
Transport etc.						
Highways (c)			3100	(23.9)	3270	(17.8)
Highway Maint.			311	(2.4)	765	(4.2)
Other	(d)		1026	(7.9)	193	(1.1)
	2125	(32.6)	4437	(34.2)	4227	(23.0)
Power	150	(2.3)	375	(2.9)	374	(2.0)
Community Fac. & Public Welfare (e)	585	(8.2)	1558	(12.0)	2204	(12.0)
Public Health	486	(7.5)	815	(6.3)	2012	(10.9)
Education	2131	(32.7)	3892	(30.0)	7243	(39.5)
Total Northeast	6516		12,958		18,385	
Total Country	23,404		46,448		100,275	
% N.E.	27.8		27.9		18.0	

(a) Land Devel. Dept., Land Co-op Dept. Dept State Credit included.
(b) Artesian wells moved to Com Facilities (c) Includes A.R.D. roads (d) Breakdown Not Available (e) Water, Community Development, public and urban programmes
Source Phisit op.cit.

averaging only 5.0% per annum over the ten year period.[36]

The growth sectors in the Northeast are not, moreover, those which are expanding most rapidly within the country as a whole. Thus for the category of 'other crops',[37] for housing and for manufacturing, sectors expanding rapidly at the national level, the Northeast's share in national production was so small that the region scarcely benefited from their growth. At the same time, in other sectors of slow growth in the national economy, such as paddy and livestock, the Northeast region contributed a large proportion of the national total. In analysing the structural composition of the Northeast economy against that of the whole of Thailand in terms of relative growth rates of the various economic sectors, both Phisit[38] and Chalmers and Cowan[39] have suggested that

> "the relative position of the Northeast is projected to deteriorate over the period 1969-76 faster than it did over the period 1960-69." 40

unless something can be done to alter the competitive position of the region very rapidly.

Various explanations have been advanced concerning the failure of the government investment to generate greater and

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36. National Economic Development Board, "Gross Domestic Product, Northeast Thailand 1960-69", Preliminary, Regional Accounts and Data Analysis Unit, National Accounts Division, NEDB, November 1970, Table 34, pp.58-59 and Table 2, pp.4-5.

37. Excluding paddy, maize, kenaf and cassava.

38. Phisit, op.cit.

39. Chalmers,J.A. and Cowan,R.S.,Jnr., "Economic Growth and Structural Change in Northeast Thailand", NEDB, Bangkok, Mimeograph, Undated.

40. Phisit, op.cit., p.141.

TABLE II - 5

Sectoral Growth in Gross Regional Product - Northeast Thailand 1960-69

SECTOR	% Growth Per Annum	G.R.P. (at Constant 1962 Prices) Million Bant	
		1960	1969
AGRICULTURE	5.0	5803.7	8470.0
(Crops)	5.2	4339.9	6224.9
(Livestock)	4.1	953.2	1349.3
(Fisheries)	8.8	153.1	313.0
(Forestry)	5.7	357.5	582.8
MINING AND QUARRYING	36.9	17.2	245.9
MANUFACTURING	6.1	716.9	1186.0
CONSTRUCTION	16.8	412.2	1623.4
UTILITIES	37.1	13.2	209.8
COMMUNICATIONS	11.5	315.8	835.8
TRADING	9.5	1270.9	2835.1
BANKING	18.5	30.4	138.6
HOUSING	2.5	249.7	312.4
ADMINISTRATION & DEFENCE	7.0	444.4	809.5
SERVICES	9.9	771.2	1801.7
TOTAL G.D.P.	7.1	10,045.6	18,468.2
PER CAPITA G.D.P.	3.6	1091	1477

Source: N.E.D.B. Gross Domestic Product, Northeast Thailand 1960-69. Preliminary Bankok 1970.

more balanced growth within the Northeast economy. Phisit has called for

> "Greater emphasis upon projects which could maximise regional income and employment effects." 41

On the other hand, NEEDPAG, in their recommendations for the Third Development Plan stress

> "human resource development as a prerequisite for economic growth in the region." 42

Both recommendations emphasise the need to reduce the investment on costly infrastructure and to help the people of the Northeast to respond to the opportunities which already exist, but there is no general agreement about how this should be done. Likewise the Thai government itself seems undecided about how to improve the situation in the Northeast. In the Third National Development Plan, to run from 1972 to 1976, the government has indeed reduced the concentration on investment in infrastructure facilities, but only to further emphasise social services which receive 62.4% of the entire budget.[43] Moreover the Northeast's share of the total plan budget has fallen to only 18%. Despite continued statements of concern about the Northeast problem, the government's handling of it is fraught with uncertainty.[44]

The Thai government in fact faces a difficult problem. It is aware of the increasing income gap between the Northeast and the other regions and of the need to transfer resources

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41. Ibid., p.34.

42. Northeast Economic Development Planning Advisory Group, "Northeast Thailand: Recommended Development Budget and Foreign Assistance Projects 1972-76", Louis Berger Inc. - Systems Associates Inc., Bangkok 1971, p.I.1-2.

43. Phisit, op.cit., Table 2-8, pp.50-51.

44. The effect of American withdrawal from the region is unlikely to help its immediate prosperity.

to this region. It is aware that the increasing contact of the Northeasterners with the rest of the kingdom is creating an element of unrest in the region which is being exploited by Communist insurrectionists. Yet it has felt unable to commit to the region a share of the investment budget in proportion to the region's area and population. It has to pay attention to the overall economic performance of the country and it is clear that the present rate of return on investment in the Northeast is much lower than in other parts of the country. To allocate a higher share of the budget to the Northeast would slow the growth of the national economy; a rapid growth in the national economy equally may tend to benefit the Northeast more than would direct investment, without, however, reducing the income gap between the regions.

At present the Thai government policy seems to be to mark time. The concentration on social services in the Third Plan aims to improve the quality of life rather than to increase income levels. In the meantime the government is seeking to improve the response to its former investments by a series of low budget projects. On the other hand, the answer to the low return on investment in the Northeast has not yet been found. The basic physical difficulty of the region and its previous long-term neglect continues to confound the planners. To understand the problems of economic development of the Northeast of Thailand, some detailed consideration of the region's physical and cultural background is therefore essential.

The Physical Environment of the Northeast Region

The Northeast region of Thailand roughly conforms with the

uplifted structural basin usually known as the Khorat Plateau. In fact the plateau extends onto the adjacent lowlands of Laos both in the north and in the east, but here the term will be used as though synonymous with the Northeast region of Thailand. Despite the term 'plateau', the region is generally of low altitude, with by far the largest part of it under 200 metres. It is composed almost entirely of red sandstones, siltstones and conglomerates of Triassic to Cretaceous age, which have been slightly downwarped in the late Tertiary era to produce

"..a saucer-shaped low platform."[45]

This platform is separated from the Central Plain and southeast of Thailand by the uplifted edges of the saucer on the west and south. These hills, known as the Dong Phraya Yen in the west and the Dong Rak in the south have suffered relatively greater deformation than the rest of the basin and limestones[46] and igneous intrusions occur in isolated localities in their midst. (Figure II-8)

From these highlands almost the whole plateau is drained by a single river system, that of the Nam Mun, which flows to the east to join the River Mekong to the east of Ubol Ratchathani town. The gradients of the Nam Mun and its major tributary, the Lam Chi, reflect the gentle slope of the plateau to the south and east and are extraordinarily low; the Nam Mun itself falls only 300 feet in a distance of 250

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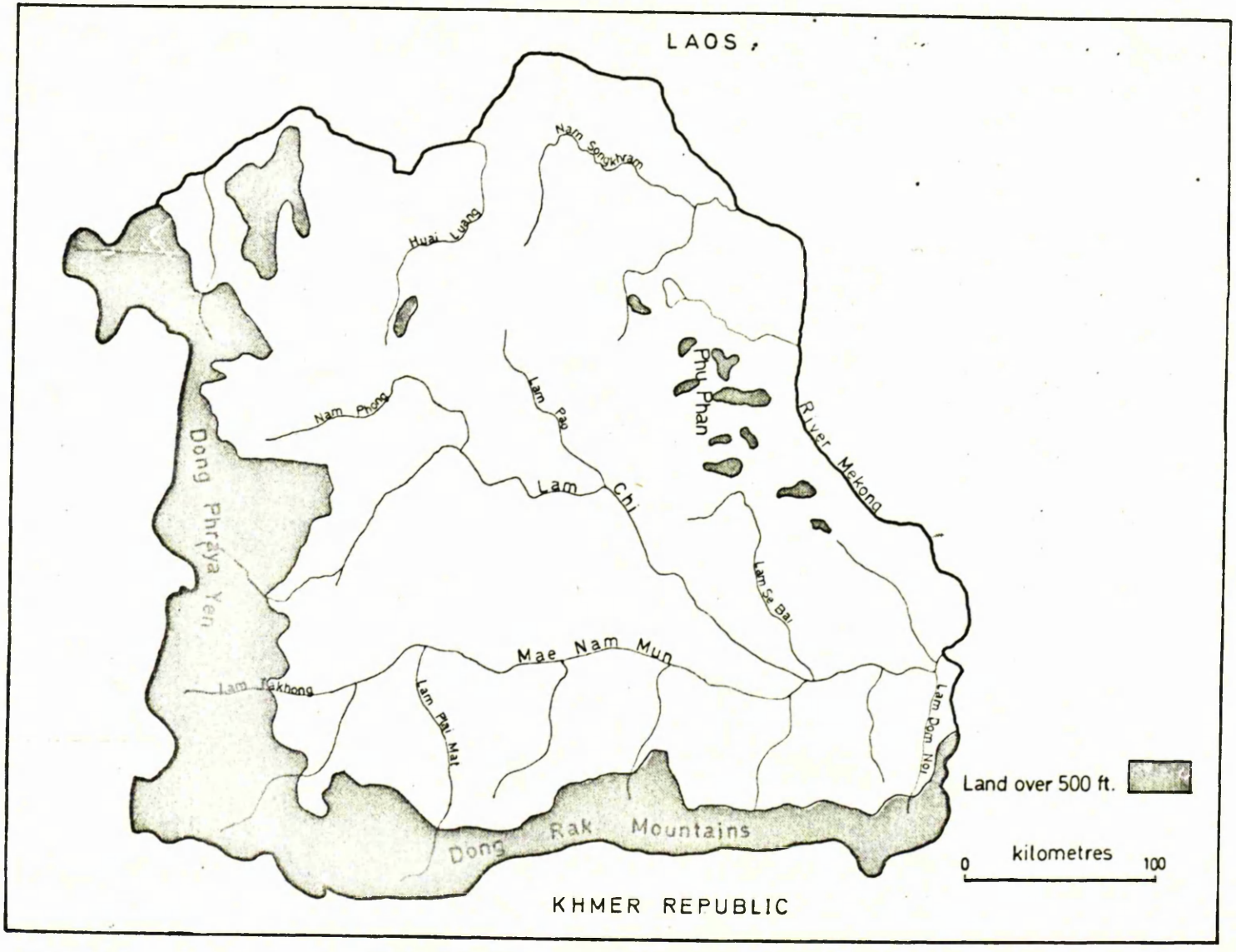
45. Pendleton,R.L., "Thailand: Aspects of Landscape and Life", New York 1962, p.43.

46. The limestones have weathered to give localities of loamy soils, relatively more fertile than common in the region. The area surrounding Amphur Pak Chong in Nakorn Ratchasima province is perhaps the most notable of these.

FIGURE II-8

NORTHEAST THAILAND : RELIEF AND DRAINAGE



miles to its confluence with the Mekong. Only the extreme north and northeast of the plateau are not part of the Nam Mun drainage system. A line of low hills, which are the only major relief features within the plateau, extend across in an east-west direction from Nakorn Phanom province, through Sakol Nakorn and Udorn Thani, to Loei, and form an effective watershed from which a series of small tributary streams flow directly to the Mekong. The River Mekong forms the border between the Northeast region and Laos except in the extreme southeast where it enters Laos, but this boundary does not necessarily correspond to the structural boundary of the plateau.

Apart from the line of hills noted above, usually known as the Phu Phan range, the Khorat Plateau is an area of low relief. In the interior the only relief is composed by the low watersheds between the major rivers. At the local scale the landscape is undulating and is dotted with many small shallow lakes. Pendleton[47] and Credner[48] suggest that these depressions, which tend to dry up in the dry season, are related to subsurface salt lenses within the sandstone bedrock and, indeed, accumulations of salt do develop in some of them in the course of dry weather.

These salt accumulations, while they constitute the chief mineral resource in the Northeast,[49] invest some of the soils

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47. Pendleton, op.cit., p.44.

48. Credner,W., "Das Land der Tai", pp.9-34, quoted in Pendleton,R.L., "Land Use in Northeastern Thailand", Geographical Review, vol.33, 1943, p.40.

49. The salt accumulations are, as yet, only exploited by primitive methods, notably in Mahasarakham province. Elsewhere in the region, the only notable mineral deposit was believed to be the iron ore of Loei province,but recently confirmation has been made of the vast deposits of phosphates which underly the region.

of the region with a high degree of salinity. Salinity, however, only adds to many other problems of soil management in the area. Because of their derivation from red sandstones, most of the surface soils in Khorat are almost entirely sandy, even where they are the result of prior fluvial erosion processes. Being sandy, the soils have a low water-holding capacity which means that crops growing in them have a limited capacity to withstand drought. Moreover the light texture has been accentuated by the washing down of the clay fraction in the soil and a rather low organic content derived from the open dipterocarp forest vegetation. Most of the clay content has been carried away in solution or precipitated at lower levels in the subsoil, where, according to the amount of iron available, it may form concretions or a whole horizon of impenetrable laterite.

These characteristics are particularly true of most of the upland areas of the Northeast, but they also apply to large areas of former forest which has been cut only recently for paddy. The valley bottom lands, by contrast, are much more potentially fertile with accumulations of rich alluvium from the regular floods of the Mekong, the Nam Mun, the Lam Chi and their major tributaries. These rich silty alluvial soils hold water well and provide a marked contrast to the remainder of the region, but they are limited in extent and, since the construction of various dams on the Mun and the Chi, their renewal by rich flood waters has been reduced.

Soil development processes at work in Thailand's Northeast are, of course, very much governed by prevailing climatic conditions. The constantly high annual average temperature is conducive to rapid chemical processes within the soil throughout the year, but these processes are particularly rapid in the heavy rains of the summer months when important mineral constituents

may be washed down through the soil; in the dry season, by contrast, evaporation and capillary actions tend to bring mineral salts back towards the surface.

These climatic conditions which affect the soil of the Northeast are strongly influenced by the region's pattern of relief as described above. Overall the Khorat Plateau is more continental in climate than the Central Plain and the North of Thailand. Temperature levels are much more extreme than elsewhere, with a greater range between the extreme minima and maxima in any one year. Temperatures in the hot season, from March to May, can be particularly high, for the Northeast does not experience the sea-breezes which penetrate the Central Plain at this period. Daily maxima of over 40°C are quite common. Similarly in the preceding cool season from December to February the Northeast suffers occasional very cold periods, especially at nighttime, resulting from the penetration of air-masses moving down from the high plateaux of Laos and China. Table II-6 compares critical temperature statistics for selected stations in the various regions of Thailand.

Although the higher hot season temperature and the common lack of cloud cover tend to increase evaporation, the rainfall regime is a rather more important element in determining the physical background to agriculture in the Northeast. The rainfall regime of Northeast Thailand is similar to that of the country as a whole and is strongly monsoonal in character. As can be seen from Figure II-9 , showing the monthly distribution of rainfall for the stations of Nakorn Ratchasima and Udorn Thani, there is a strong concentration of rainfall in the period of the south-west monsoon between May and September, with the peaks of May-June and September separated by lower

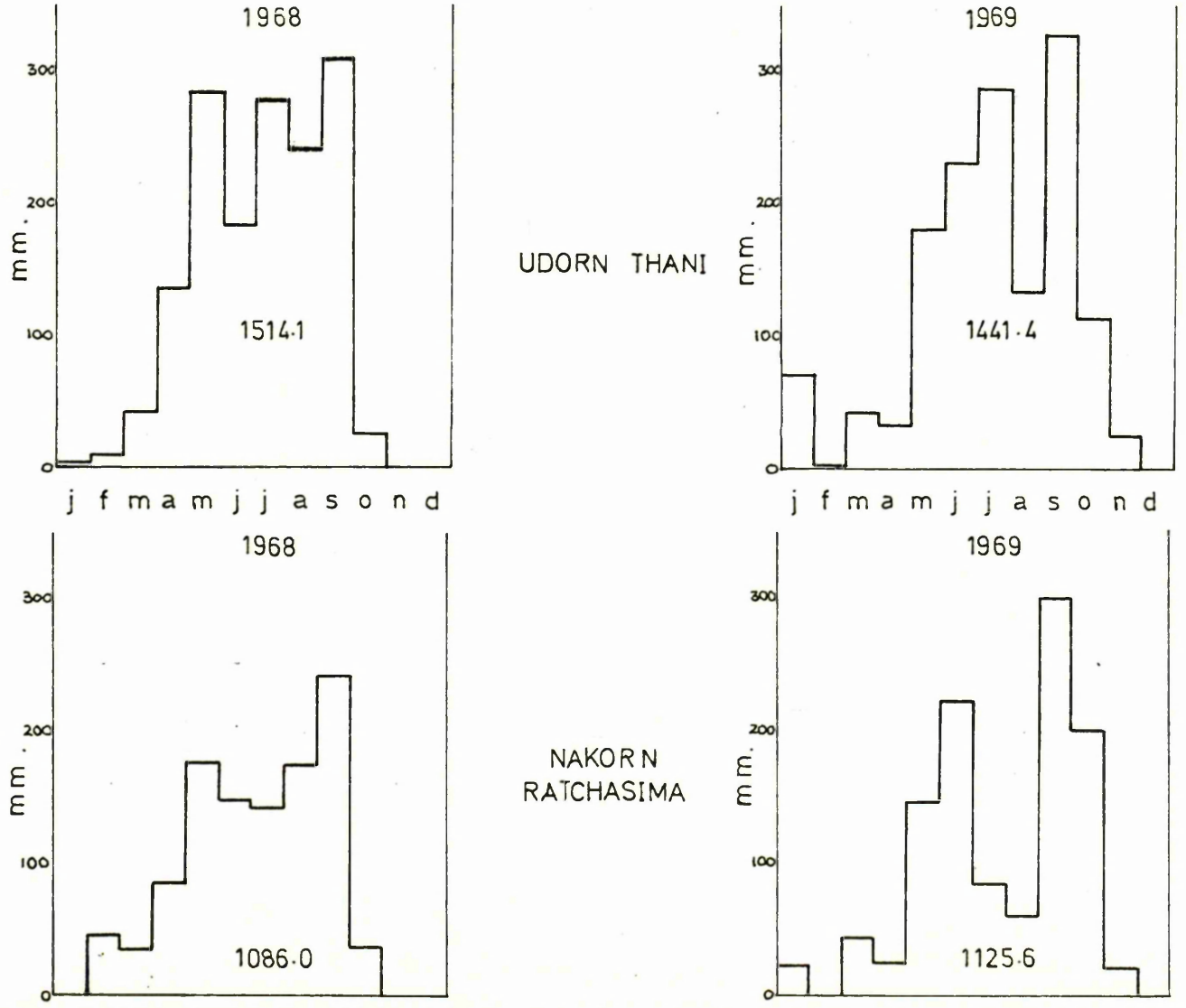
TABLE II - 6

Temperature Data for Selected Stations in Thailand 1967-70

	Mean Annual (°C)				Extreme Low (°C)				Extreme High (°C)			
	1967	1968	1969	1970	1967	1968	1969	1970	1967	1968	1969	1970
CHIANGMAI (N)	25.7	25.9	25.9	25.7	8.6	16.5	16.4	17.0	40.0	34.3	35.0	34.5
UDORN (NE)	26.3	27.4	27.5	26.7	6.5	18.8	18.5	18.4	40.0	35.4	35.6	35.1
NAKORN RATCHASIMA (NE)	26.8	27.5	27.8	27.5	9.1	18.7	18.7	18.5	40.8	37.0	37.2	37.2
NAKORN SAWAN (C)	28.1	28.4	28.3	28.7	9.5	19.9	18.9	18.8	41.1	36.3	37.4	36.4
BANGKOK (C)	28.3	28.7	28.6	28.3	12.9	22.1	22.3	21.4	37.9	35.0	35.0	35.1
SONGHKLA (S)	27.5	27.8	28.0	27.7	20.3	22.2	22.3	22.1	34.8	33.3	33.8	33.2

Source: Ministry of Agriculture: "Agricultural Statistics of Thailand 1970", Bangkok 1972. Table 68. p. 128.

FIGURE II-9 : NORTHEAST THAILAND - MONTHLY RAINFALL 1968-69 SELECTED STATIONS



Source : N.S.O Thailand Statistical Yearbook

rainfall in the months of July and August. From November to February, on the other hand, the region rarely receives any rain at all. Whereas the mountains on the western and southern edge of the plateau do not constitute an effective barrier to the south-west monsoon, the higher range of the Annamite chain in Vietnam and Laos prevent the penetration of air masses with the north-east trade winds. Only very occasionally do these influences break into the plateau area, but when this phenomenon does occur, it usually brings deep depressions from the South China Sea which sweep across the region as line squalls bringing heavy rain. The rather heavy rainfall recorded in Udorn Thani province in January 1969 is likely to have been one of these incursions. (Figure II-9).

Despite the more continental position of the Khorat Plateau between two ranges of hills, it does not suffer any marked rain-shadow effect comparable with that of the valleys of the Northern region, or indeed, of the northern part of the Central Plain. Table II-7 shows that the actual rainfall totals at the standard northeast rainfall stations of Udorn Thani, Roi-et and Ubol Ratchathani are on average higher than those experienced in Chiangmai and Nakorn Sawan and are on a par with the average figures for Bangkok and Aranyaprathet on the Khmer border. Only in small areas in the southwest of the region, where there may be some slight rain-shadow effect from the Khao Yai mountains, does rainfall fall below an average of 1200mm. per annum. (Figure II-10).

Nor does it seem that the Northeast has a notably more irregular rainfall regime than in the other regions. If the coefficients of variation of the stations presented in Table II-7 are examined, it will be noticed that the highest values

TABLE II - 7

Thailand: Annual Rainfall 1951-70

Selected Stations

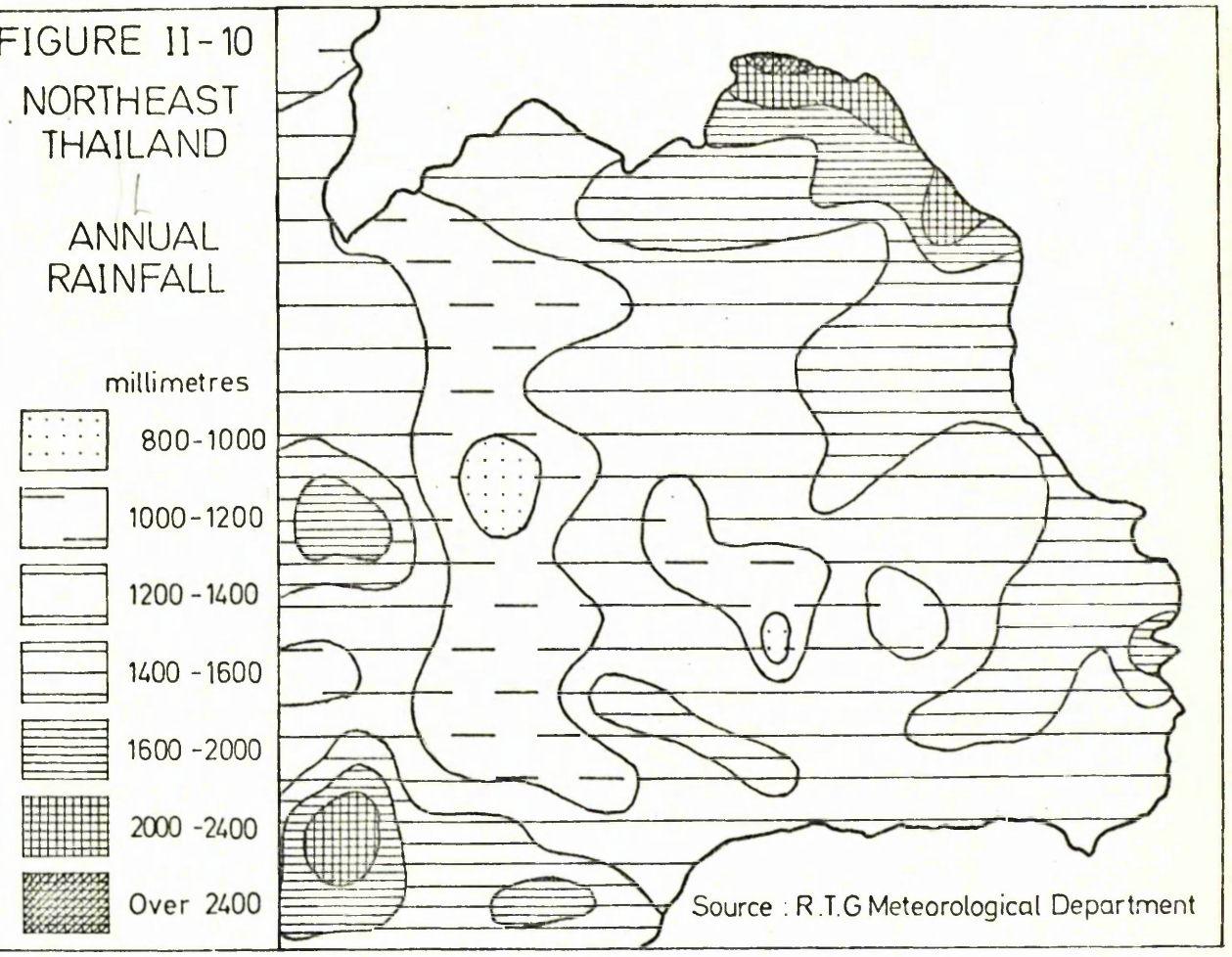
Station	Mean Annual	Deviation	Maximum	Minimum	Coefficient of Variation
			(Millimetres)		
CHIANGMAI	1254.95	261.87	2032.0	865.0	20.87%
UDORN THANI	1537.45	249.21	2415.0	1144.0	16.21%
ROI-ET	1399.75	201.14	1861.0	1116.0	14.37%
NAKORN SAWAN	1186.10	208.59	1485.0	887.0	17.61%
BANGKOK	1502.45	253.67	1957.0	876.0	16.88%
ARANYAPRA-THET	1561.75	209.86	1884.0	1207.0	13.44%
SONGHKHLA	2148.24	434.25	3354.0	1545.0	20.21%

Source: Royal Irrigation Department

FIGURE II-10

NORTHEAST THAILAND

ANNUAL RAINFALL



are recorded by Chiangmai and by Songkhla in the southern peninsula. Of the three northeastern stations, Ubol records the highest variation, but Udorn is on a par with other Central Plain locations and Roi-et has the second lowest coefficient.

The Northeast of Thailand, then, neither has a markedly lower rainfall than other parts of the country, nor does it have a notably higher variation in annual total than is recorded at other stations. Yet it is probably true that agriculture in the region is less assured and less productive than in the other parts of Thailand. This may be explained by a number of factors. First, the Northeast is almost wholly dependent on rainfall for its agricultural livelihood. Whereas the Northern region has a lower average rainfall total, it has long developed supplementary irrigation facilities leading off the major feeders of the Chao Phraya system. Similarly in the last fifty years large-scale irrigation works have been constructed throughout the broad Central Plain of the country. Again, the soils of both the Central Plain and the Northern valleys are mainly composed of impermeable alluvial deposits which hold water easily. By contrast, as has been noted above, the soils of the Northeast region are mainly derived from sandstones and tend to be highly permeable. Thus, although rainfall levels are comparable with those of other regions, the effective rainfall is rather lower.

Moreover, if the annual variation of rainfall in the region is only 10-20%, the variation in specific months is much higher. Although the highest co-efficients are recorded at the height of the dry season in November, December and January, it is the lower variations at other times of the year which are more important. Table II-8 presents the monthly coefficients of variation for the Royal Irrigation Department rainfall station

TABLE II - 8

Northeast Thailand: Monthly Rainfall 1953-1970

Changwat Kalasin

(millimetres)

Month	Average	Deviation	Maximum	Minimum	Coefficient of Variation
APRIL	54.55	33.50	113.0	0.0	61.41%
MAY	206.91	99.70	502.1	81.4	48.19%
JUNE	208.78	102.00	426.1	51.0	48.86%
JULY	206.69	90.81	399.6	94.7	43.94%
AUGUST	239.44	126.33	642.1	87.8	52.76%
SEPTEMBER	302.11	131.92	594.6	79.5	43.66%
OCTOBER	62.43	42.37	177.9	6.0	67.86%
NOVEMBER	6.31	13.69	54.3	0.0	216.95%
DECEMBER	0.07	0.30	1.3	0.0	428.57%
JANUARY	10.48	26.85	99.2	0.0	256.20%
FEBRUARY	17.85	31.58	102.3	0.0	176.91%
MARCH	27.89	32.36	102.7	0.0	116.02%
ALL YEAR	1343.51	239.16	1950.7	979.6	17.80%

Source: Royal Irrigation Department

at Kalasin. This indicates that at the crucial period of planting the variation may be as high as 48% or more from one year to the next and minimum falls of 81.4mm. have been recorded in May and 51.0mm. in June during the eighteen years of the records. Rainfall of this level is bound to set back the start of rice cultivation, just as falls of the intensity of 500mm. at this season are equally likely to cause serious disruption from flooding. For an early start to kenaf cultivation, the likelihood of adequate rainfall for ploughing in March and April is even lower.

The general physical background of the Northeast region puts it at an immediate disadvantage in comparison with the other regions of Thailand. Although it has been said to be a generally marginal area for paddy cultivation, it receives as much if not more rainfall than other highly productive parts of the country. However, it seems that the rainfall in the Northeast is less effective than elsewhere and is highly unreliable at the crucial period for crop preparation. The soils of the region, except in the narrow alluvial plains of the Nam Mun and Lam Chi, are permeable, and, formed from the sandstone bedrock, largely acidic. Salt deposits underlie the basin and are brought to the surface in the dry season. In combination, the poverty of the environment produced by these factors contrasts markedly with more favoured areas of the country.

The Cultural Background of Northeast Thailand

The physical separation of the Khorat Plateau from the Central Plain of Thailand is emphasised by the sharp scarp it

presents towards the lowland. Although the uplands of the rim of the Khorat Plateau scarcely form a barrier to climatic influences from the Central Plain however, they do represent a conspicuous cultural divide. Similarly the Nam Mun drainage system, flowing into the Mekong, represents an orientation away from the Central Plain. As Keyes puts it:

> "...the Khorat Plateau and the Maekhong (sic) Valley and the tributary valleys of Laos form a natural geographical unit, an area which is unified rather than divided by the Maekhong." 50

Moreover, the people of the Northeast region share a basic similarity with the people of Laos. The so-called 'Isaan' dialect is closely related to the Lao language, so much so that the Northeasterners are often known as the 'Thai-Lao' and the standard diet of Laotian and Northeast Thai alike is the glutinous variety of rice. Although originally this preference may have been a response to physical conditions in that the glutinous varieties tended to mature more quickly,[51] the present preference is clearly one of habit. Indeed, whereas the history of the Siamese kingdom is centred around a steady movement of peoples down the Chao Phraya valley, the history of the Northeast is intimately linked with that of the Lao kingdoms to the north and, to a lesser extent, to the Khmer empires to the south.

By the twelfth century A.D., from their great ceremonial capitals at Angkor Wat, the Khmer kingdoms had spread their rule over most of the Khorat region and indeed over the lower Chao

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50. Keyes,C.E., "Isan: Regionalism in Northeast Thailand", Ithaca 1967, p.1.

51. Watabe,T. "Glutinous Rice in Northern Thailand", Reports on Research in Southeast Asia, Natural Science Series N.2, Centre for Southeast Asian Studies, Kyoto, 1967, p.7.

Phraya valley. Hereafter Khmer influence was slowly eroded, but, as late as the sixteenth century, Hall notes fresh incursions into the Khorat Plateau.[52] Nevertheless, after the Thai armies had sacked Angkor in 1431, the Khorat region became a centre of Lao influence and was incorporated into the kingdom of Laan Xang. Keyes draws attention to a Thai history of Kalasin province which

> "..reports a steady migration of Lao peoples into the area between 1050 and 1750." 53

and it is clear that for some centuries the area was recognised as an area of Lao suzerainty, although it seems to have been divided into a series of small local states.[54]

It was not until the break-up of the successor Lao kingdom of Vieng Can in the early eighteenth century that Siam began to show any interest in the Northeast and then only when it was threatened from Laos. In 1825, the Lao were still powerful in the region, for, as Hall remarks

> "..after fortifying Northeast cities, the king of Vientiane attacked the Siamese with three armies from Ubon, Roi-et and Vientiane." 55

This incursion led the Siamese to take over nominal control of the Khorat Plateau in 1827, but even then the region was left very much to its devices and petty spheres of influence began

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52. Hall,D.G.E., "A History of Southeast Asia", London p.136.

53. Keyes, op.cit., p.8. See also Government of Thailand, Ministry of the Interior, "Khor Muun Karn Talat Khong Changwat Kalasin 2513", Economics Department, Changwat Mahasarakham p.1.

54. Silcock, T.H., "The Economic Development of Thai Agriculture", Ithaca 1970, p.148.

55. Hall, op.cit., p.136.

to emerge once again. Throughout the period of reform instituted by Kings Mongkut and Chulalongkorn in the second half of the nineteenth century, Khorat continued to be neglected and it was only as a response to external pressures that the Bangkok dynasty was forced to assert itself there.

French support of Khmer claims in the area, followed by their compulsion of the Siamese to cede all the territories east of the Mekong to their protectorate in Laos, brought a worried reaction from Bangkok. Rapid efforts were made to link the region with the rest of the kingdom to forestall pretexts for French intervention. By 1900 a railway line had been constructed to Khorat town; telegraph communications reached Nongkhai and Ubol Ratchathani in 1907; in 1928, the railway was extended to Ubol and in 1933 another branch reached Khonkaen. In addition, the Primary Education Act of 1921 brought the people of the Northeast into contact with central Siamese culture.

Nevertheless, in spite of these efforts to improve communications and to draw it permanently into the Thai kingdom, the Northeast remained very much a frontier area. In Bangkok the region was seen in colonial terms as a supplier of both draught animals and human labour for the rest of the kingdom. The improvement of communications only helped the more enterprising Northeasterners to leave the area rather than stimulating its economy. As more people left the region, however, it became more apparent to them that the people of Khorat were the second-class, under-privileged group in the country and Northeast intellectuals began to speak up for the region in high places in Bangkok.

Anger rose in the period following the 1932 revolution,

but was restrained by the onset of the Second World War. In the postwar period the situation has become more complicated and once again external pressures have tended to force the Bangkok government to take notice of this internal problem area.[56] Early post-war outbreaks of regional discontent, allegedly by supporters of pro-Communist secessionists, were taken in an American-dominated Thailand as further confirmation of the domino theory at work.[57] The French collapse in Indo-china stimulated the first wave of large-scale United States investment in Thailand[58] and throughout the late 1950s and early 1960s the number of U.S. military personnel in Thailand, particularly in the Northeast, was slowly increased.

For their part, the Thai government in their National Economic Development Plans began to invest heavily in the Northeast,[59] as has been seen above. Nevertheless the previous neglect of the region with its almost exclusively agricultural economy has weighed heavily against the success of this investment. The region remains heavily dependent on its

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56. Bell,P.F., "Thailand's Northeast: Regional Underdevelop-ment, Insurgency and Official Response", Pacific Affairs, vol.42(1), 1969, pp.47-54.

57. A feeling still held by some at the present time. Follow-ing the Communist takeover in Indochina in 1975, fears for the Northeast have grown, particularly in the context of Pathet Lao claims to its 16 provinces.

58. The relationship between U.S. non-military investment and the state of the Indochina war has been clearly brought out by Caldwell,J.A., "American Economic Aid to Thailand", Lexington 1974, especially Chapter 3, pp.27-69.

59. In fact the impetus for investment in the Northeast owed something to the efforts, as head of government, of Field Marshal Sarit Thanarat whose home province was Nakorn Phanom.

traditional agricultural sector. It is true that the contribution of agriculture to the Gross Regional Product fell over the period 1960-69 by 11.8%, while it declined by only 8.4% in the kingdom as a whole. However, by 1969

> "..the agriculture share of the total Northeast GRP at 45.2% was still 7.4 percentage points higher than the 37.8 percent share represented by agriculture for the Kingdom as a whole nine years before in 1960." 60

and there has only been a marginal shift away from the sector since then.[61] With the reduction of the Northeast's share of the total investment budget under the Third National Economic Development plan and the likely withdrawal of the American military presence, agriculture seems destined to maintain its position. If the regional economy of the Northeast is to expand even at the same rate as in the 1960s over the coming years, then it is the agricultural sector which must be the basis of this expansion. This will require great efforts, for the region's agriculture is still largely based on the semi-subsistent cultivation of paddy rice, previously a monoculture, but now supplemented by the expansion of upland cash cropping. As a rice-growing area the Northeast cannot compete with other regions of the country; at present diversification has not progressed far and appears still to be rather unstable.

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60. Northeast Economic Development Planning Advisory Group, "Northeast Thailand: Sector Growth Rates and Targets", Stage 3 Planning Report, Louis Berger Inc. - Systems Associates Inc., NEDB, Bangkok 1970, pp.1-6.

61. NESDB, "Preliminary Regional Gross Domestic Product; Period 1967-1971 and Estimates 1972", Bangkok 1973, p.17 suggests an agricultural share of 45.2% for 1972. Its 1969 revised figure of 49.1% is however higher than that published by NEEDPAG.

The present position and the future prospects for agriculture in the Northeast will now be examined.

The Agricultural Economy of the Northeast

Throughout the 1960s, rice has remained the most important crop within Northeast Thailand. A breakdown of the contribution of crops to Gross Regional Product since 1960 indicates that the share of paddy has certainly not declined over the decade and may well have increased.[62] Its annual contribution has varied with the relative performance of other crops and the environmental conditions in any one particular season. During the decade, rice reached a maximum of 67.7% in 1962, following a major recession in the kenaf trade; it fell to a minimum of 51.0% in 1967 when widespread drought particularly affected the paddy crop. (Table II-9).

The dominant position of rice is further emphasised by reference to the areas planted under various crops. In 1963, the Census of Agriculture[63] recorded that rice occupied some 93.35% of the total cultivated area.[64] It is clear that, as was noted above, 1963 was a year in which the area under kenaf, the only other major single crop at the time, had contracted following poor market conditions. Nevertheless the concentration in paddy must have been of that order in other years. By 1970

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62. NEEDPAG, Stage 3, op.cit., p.2-1.

63. National Statistical Office, "Agricultural Census of Thailand, Northeast Volume 1963." Bangkok 1964.

64. This figure showed little change from the pre World War II period. Pendleton shows that in 1938-39, rice covered 98.97% of the cropped area. Pendleton, "Land Use in North-eastern Thailand", Geographical Review, vol.33, 1943, p.26.

TABLE II - 9

Contribution of Various Crops to Gross Regional Product from Crops. Northeast Thailand 1960-69

(Constant 1962 Prices)

Crop \ Year	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
					(Percent)					
Paddy	56.3	55.8	67.7	63.8	63.0	54.8	60.2	51.0	64.2	61.5
Maize	2.5	1.2	1.0	0.8	0.9	1.0	1.3	1.8	1.9	2.0
Kenaf	8.3	10.3	5.6	7.5	11.4	19.1	18.4	19.2	6.8	11.4
Fruit	15.0	15.9	12.6	12.7	10.1	10.7	8.7	12.5	12.0	11.1*
Tobacco	3.7	3.0	1.5	2.0	1.7	2.1	1.8	2.6	2.4	2.2
Vegetables	0.7	0.9	11.0	1.3	1.4	1.4	1.7	2.5	2.5	2.3
Chillies Garlic Onions	3.4	4.8	4.1	4.5	3.4	3.3	2.7	3.5	3.3	3.0

Source NEDB: Gross Domestic Product, p. 8-9 op.cit.

the share of rice in the total area planted had fallen to 75.25%.[65] In only two changwats[66] does this proportion fall below the 50% level and in Sakol Nakorn and Ubol Ratchathani the percentage exceeds 90%. As Figure II-11 shows, there is a general decline in diversification towards the central and southern part of the region away from the market influence of Bangkok and, to a lesser extent, away from Vientiane to the north.

Within the Northeast as a whole, it is the glutinous variety of rice which still dominates. This is the staple food in the greater part of the region, with the exception of the southern changwats from Nakorn Ratchasima through Buriram and Surin to Sri-sa-ket, and its continued strong position indicates a lack of commercial orientation in the region as a whole. In 1955-7, the average proportion of the planted rice area in non-glutinous rice was 24.7%; by 1968-70, this had risen to 33.4%.[67] This does suggest some degree of changeover to the non-glutinous varieties, but the increase seems to be taking place in the traditional non-glutinous growing areas south of the Nam Mun. Beyond the Nam Mun the predominance of the glutinous variety is as strong as ever; as Figure II-12 shows, the percentage of planted area in glutinous rice in crop season 1970-71 remained over 90% in six provinces, Kalasin, Nakorn Phanom, Mahasarakham, Loei, Sakol Nakorn and Ubol Ratchathani.

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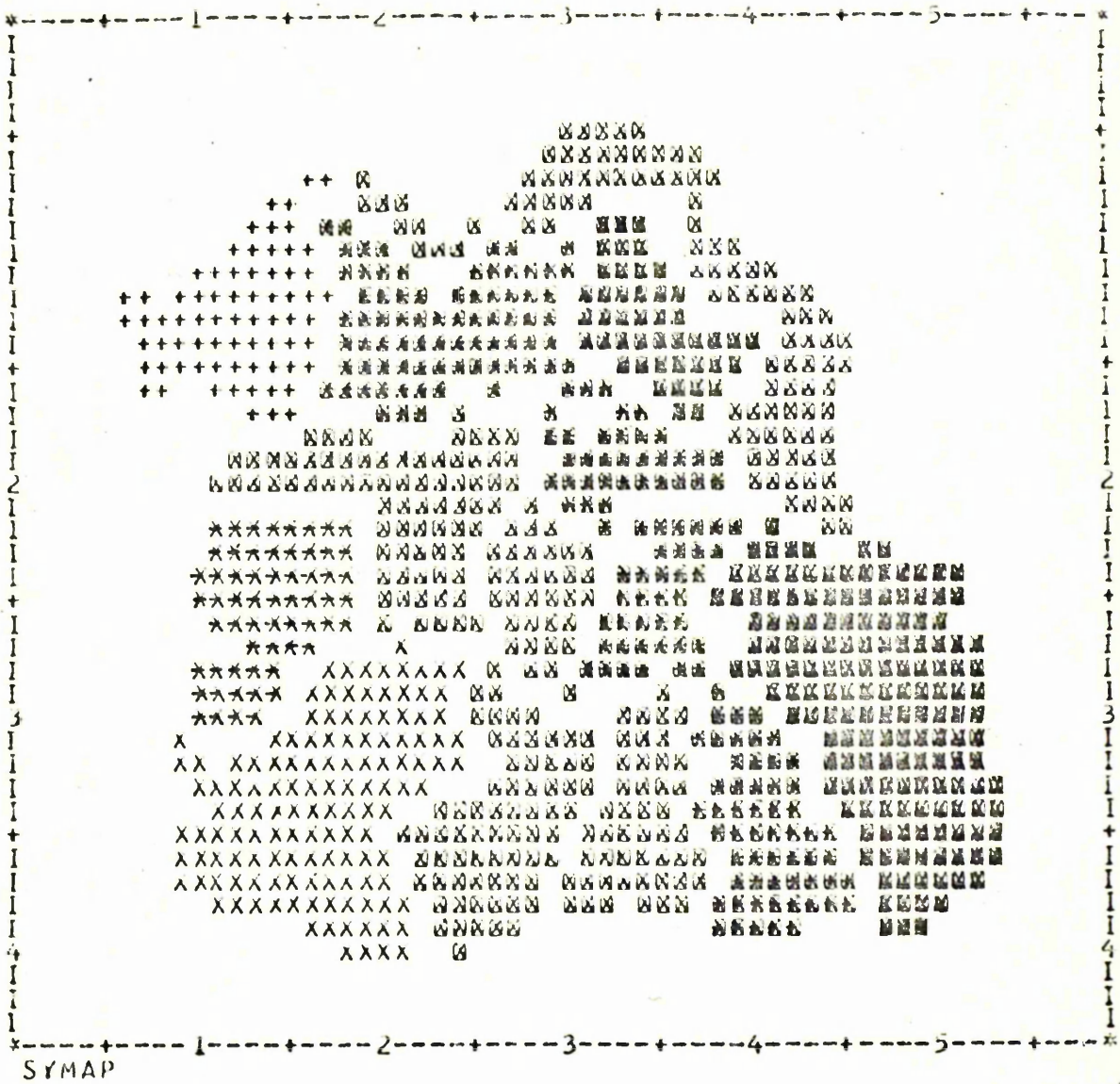
65. Department of Agricultural Extension, "Phaen-Thii Songserm Karn Kaset Phak Tawan-Ork Chiang Nuea, 2515-19", Bangkok 1971.

66. Thai for 'province' - see Thai glossary.

67. Department of Rice, "Annual Rice Reports 1961-65", Ministry of Agriculture, Bangkok. In more commercialised areas the non-glutinous area varies from year to year according to the relative prices of the two types of rice.

FIGURE II-11
NORTHEAST THAILAND : % CULTIVATED AREA UNDER PADDY 1970-71



SYMAP

	%		%
+ + + + +	0 - 30		71 - 80
X X X X X	31 - 50		81 - 90
* * * * *	51 - 70		91 - 100

The preference for glutinous rice in the Northeast today is, as was noted above, a matter of taste and tradition. Indeed paddy cultivation as a whole in the region is very much based on traditional practices. Crop production throughout most of the region still depends on the erratic climatic conditions described above and farmers must wait for the main monsoon rains before they can cultivate their paddy fields. A wide variety of seeds is used, usually of the traditional native varieties, and it is common for different types of seed to be used on different types of land. The rice is almost exclusively transplanted and even in the main river valleys there is no land regularly flooded to depths which would encourage the broadcast sowing common in the Central Plain.[68]

The manner of cultivation depends very much on the timing of the rainfall. If he has time, a farmer will plough his land twice, once to break up the soil, usually in May, and the second to prepare it for the seedlings (in June). If time allows he will harrow the soil immediately before transplanting to facilitate the regulation of water in the field, but this process or even the second ploughing may be sacrificed if the rains are late and the seedlings in need of transplanting. In all these tasks the investment is minimal; draught labour is provided by the farmer, his family and his livestock, buffalo for ploughing and buffalo and cattle for transportation; all the equipment for land preparation and harvesting alike the farmer is usually capable of making himself or with the help of skilled artisans in the

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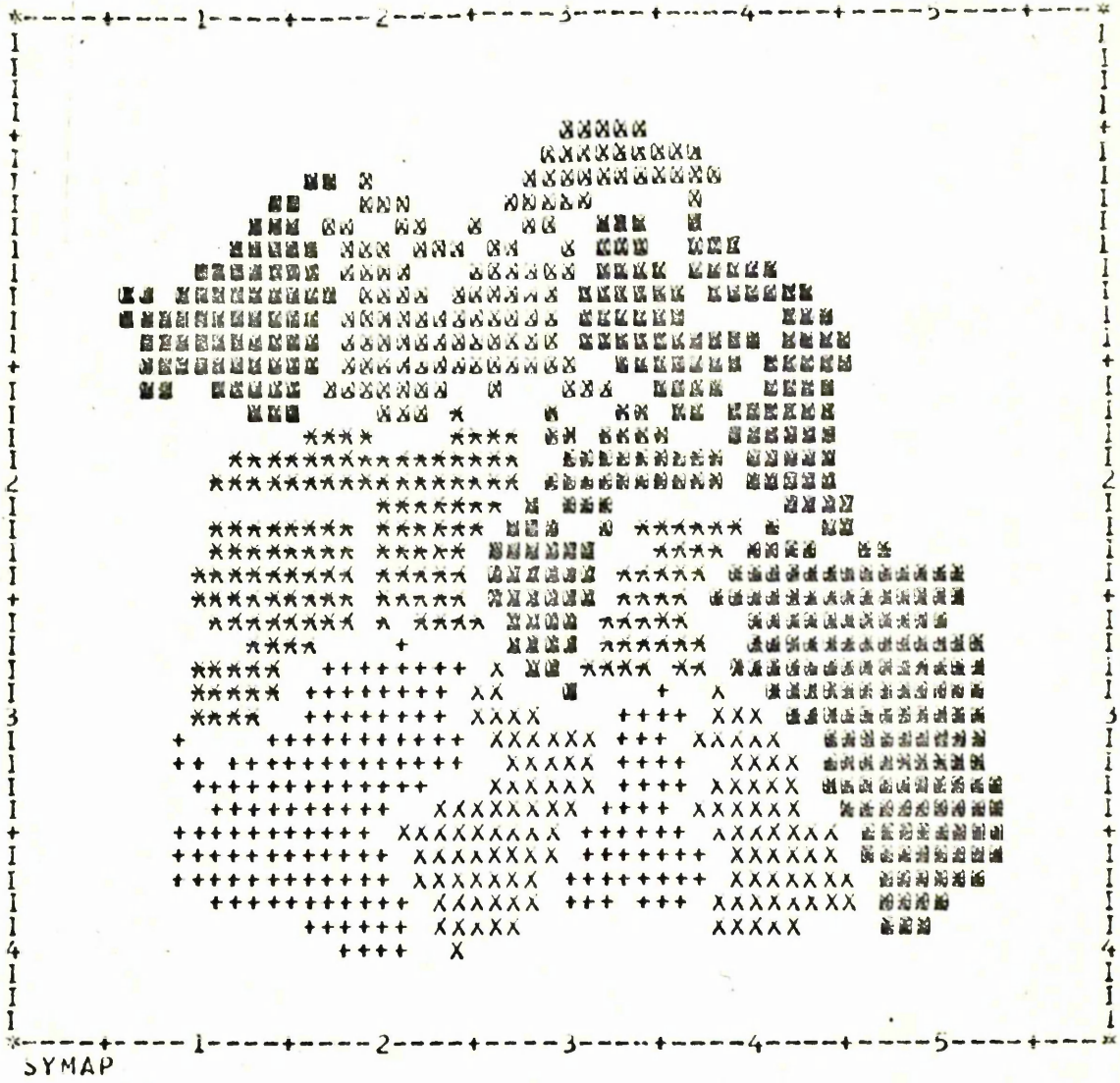
68. When the rains are late, some broadcast sowing of the bottom lands, forsaking the time consuming levelling and transplanting, may be practised in the hope of some sort of crop.

FIGURE II-12
NORTHEAST THAILAND : % RICE PLANTED AREA IN GLUTINOUS RICE 1970-71



SYMAP

	%		%
+ + + + +	0 - 25		76 - 90
X X X X X	26 - 50		91 - 95
* * * * *	51 - 75		96 - 100

village community.[69] Until recently no cash investment has been common; the use of fertilisers has been confined to animal manure.[70]

Traditionally the Northeastern farmer has used the available land extensively. If a farm family required additional land it has always been possible to cut land from the forest and develop it. This too has been the method of solving the problem of the high rate of population growth in the Northeast. With improved medical care in the past few decades, population has been growing at some 3.0 percent per annum, with the increase over the 1960-1970 intercensal period being recorded at 2.95 percent.[71] Nevertheless the ample availability of easily cleared land in the region meant that, as population in the region steadily increased, the size of the holding did not necessarily fall. Although a farmer may have had three or four offspring, they did not force him to subdivide his original holding but rather developed the forest to make plots of their own.[72] Thus the area planted to rice in the Northeast expanded continuously, although partly in response to market opportunities as communications improved.

This expansion of the planted area under paddy has continued to the present day as demonstrated by Figure II-13. Thus despite the fall in the proportion of the total planted area under paddy in the Northeast, this does not represent a movement from rice cultivation. This declining share can easily be explained in

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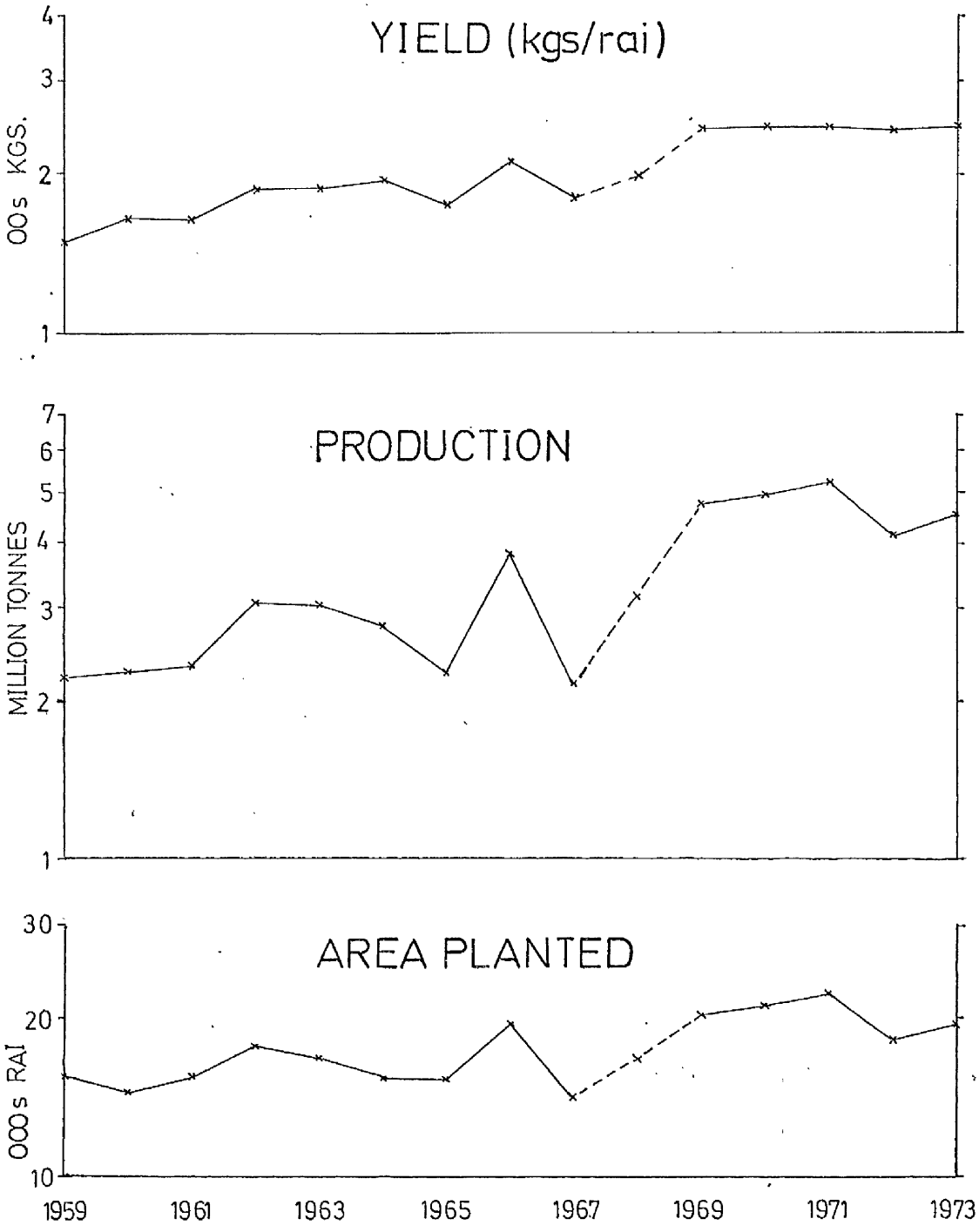
69. Farmers are now increasingly turning to manufactured farm tools available for sale in the towns. The steel plough stock is slowly replacing the traditional wooden variety.

70. The manure is commonly applied to the seed-bed rather than the paddy fields.

71. National Statistical Office (1972), op.cit.

72. In fact the pattern of inheritance in the Northeast is chiefly matrilineal and sons are expected to make their own way. But see below, Chapter IV.

FIGURE II-13 NORTHEAST THAILAND PADDY AREA PLANTED, PRODUCTION, YIELD 1959-73



Source : Ministry of Agriculture, Annual Rice Reports

terms of the continued development of upland areas for cash cropping since the late 1950s, rather than the conversion of rice land to other crops. Although the area under non-rice crops expanded rapidly from 1,294,701 rai in 1963[73] to nearly 7 million rai in 1970,[74] the area planted to rice also increased, if not at the same rate. In 1955, the area planted to paddy in the Northeast was 14.5 million rai;[75] by 1970, it had gone up to 21.2 million rai, a rise of 46%.[76] Until the 1950s the expansion of paddy cultivated area had been accompanied by a steady decrease in the per unit area yield; since then, however, the fall in yields has been reversed and production has been able to expand at a rate faster than would be accounted for by the mere increase in planted area.[77] The upturn in yields may be attributed to the adoption of semi-improved rice varieties and the slow increase in the use of chemical fertilisers. Figure II-13 presents the trends in planted area, production and yield per rai for the Northeast in the post-war period.

The expansion of planted area and the increase in yield per rai, which according to NEEDPAG has been faster than in the country as a whole,[78] have meant that rice production in the Northeast has expanded at an annual rate of 3.4%

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73. National Statistical Office, 1964, op.cit., Table 6, p.19.

74. Department of Agricultural Extension, op.cit.

75. Department of Rice, op.cit.

76. Department of Agricultural Extension, op.cit.

77. NEEDPAG submit that yields continued to decline between 1950 and 1959 of 1.8% per year, since when the trend has been upward. NEEDPAG, Stage III, op.cit., pp.2-4.

78. Ibid.

between 1960 and 1969.[79] This rate of increase in production has certainly outstripped the rate of population growth and has meant that the region has had in most years more than enough rice for consumption within the region, as it has done for many years. In 1953, the Thailand Economic Farm Survey estimated that 80.25% of the Northeast's production was consumed within the region leaving the rest for other disposal, usually sale.[80] Silcock, using data from the National Statistical Office Household Expenditure Survey of 1962/3, calculated that the Northeast required about 1.730 million tons of milled rice in that year to feed a population of 9.4 million persons.[81] This is the equivalent of 2.595 million tons of paddy, of which 1.860 million tons was likely to be in demand for glutinous rice. If this is compared with the actual production figures recorded for 1962-3, it will be seen that this left the Northeast with a surplus of almost 400,000 tonnes of paddy in each year, of which 150,000 tonnes was glutinous rice and the rest non-glutinous.

It seems clear that in the years of the Household Expenditure Survey the Northeast did have, as it had in 1953, a paddy surplus. On the other hand, it must be noted that the calculations of paddy equivalent made by Silcock were based on a milled to paddy ratio of 0.66, which appears somewhat higher for many village mills.[82] Given this proviso, however, the apparent

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79. Ibid., pp.2-3.

80. Ministry of Agriculture, "Thailand Economic Farm Survey 1953" quoted in Silcock,T.H., (ed), op.cit., p.235.

81. Silcock, T.H., (ed), op.cit., p.237.

82. An observation made on the basis of personal observations at village mills in the region, where a milling ratio of nearer 50% is common.

surplus in the early 1960s does seem to be real enough and, with the upturn in yields, particularly since 1966, it may be taken that the surplus has been maintained. There have been occasions when some areas of the region have suffered from local shortages, as in the drought of 1967 affecting in particular Khonkaen and that of 1972 affecting Nakorn Ratchasima, Chaiyaphum, Buriram, Khonkaen and Loei, but in each case other parts of the region have been able to make up the deficit. Such events, however, make the actual size of the Northeast's surplus difficult to calculate. Its surplus is made up of the excess production of many small farmers whose assessment of their consumption requirements is coloured by the unreliability of the crop. Farmers are careful to hold back some of their crop in case of emergency so that in some years individuals may have nothing to sell.

The prospects for the Northeast's rice economy are also affected by other factors. As was noted above, the present surplus has been generated by the steady expansion of planted area and the upturn in yields since the early 1960s. It is doubtful whether either of these contributary factors can be maintained over a long period in the future. Already it seems clear that there is little new land now available for conversion to paddy, what does exist is patently marginal and there are signs of abandonment of some of this newly converted paddy in parts of the region. Moreover, the region's ability to increase yields much above present levels must be open to some doubt. The upturn in the 1960s was brought about by the introduction of semi-improved varieties into the region, varieties with a high adaptability to the varying environments of the region. Now, higher-yielding varieties are more

specialized and require greater water control than is available over most of the region; their potential area of adoption is therefore limited. NEEDPAG's pessimistic forecast that

> "Northeastern rice yields are not expected to rise much above 230 kilos per rai, at least not during the (1972-76) plan period" 83

has already been proved mistaken, but the scope for improvement is not unlimited.

It would seem doubtful therefore if the Northeast's surplus in rice can be maintained for much longer. Any forecast of its disappearance by 1976 would be erroneous, but it should not be assumed to be a permanent resource for the region. Moreover, even if the surplus can be maintained, there is no guarantee that there will be any market for it, particularly in the case of glutinous rice. If some measure of stability is achieved in Laos, the main market for the Northeast's glutinous rice will disappear. For either of these reasons, therefore, it is apparent that rice, and glutinous rice in particular, is an unreliable base for future agricultural and general economic development in the Northeast of Thailand. If development there is to be centred on agriculture, then it must be through diversification of the present cropping pattern.

It would not be true to say that there has been no penetration of new crops into Northeast Thailand since the 1950s, but with the exception of kenaf their expansion has been very uneven. Discounting the traditional garden crops like bananas and mangoes which cover a considerable acreage overall, a number of crops were planted over an area of more than 100,000 rai in 1970. Table II-10 presents these crops.

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83. NEEDPAG, Stage III, op.cit., pp.2-4.

TABLE II - 10

Northeast Thailand:

Area Planted in Non-Rice Crops

CROP	1968	1969	1970	1971
		(RAI)		
KENAF	1,429,056	1,909,844	1,857,759	2,197,883
MAIZE	647,295	820,822	838,708	1,132,248
PEANUTS	213,913	212,123	275,622	174,098
COTTON	349,451	217,143	194,251	171,148
SUGAR CANE	211,141	175,971	184,058	171,549
WATER MELON	151,237	146,775	137,290	84,045
CASSAVA	56,573	105,195	101,060	210,972

Source: Dept of Agricultural Extension

"Satiti Karn Pluuk Phuet Rai Le Phuet Phak" 2511, 2512, 2514 and

"Phaen-Thii Songserm Karn Kaset Phak Tawan-Ork Chiang-Nuea" 2515-2519.

Most of these crops are very restricted in their distribution. Of the total area planted to maize, 636,500 rai (76%) was grown in the single changwat of Nakorn Ratchasima. Of the area under peanuts, 68% was planted in Nakorn Ratchasima, Buriram and Surin, along the southern border of the region; the concentration of cotton in Loei province was even higher at 79% and Udorn Thani and Nakorn Ratchasima dominated the production of sugar cane and cassava respectively with 54% and 83% of the total planted area. In these distributions the single province of Nakorn Ratchasima (Khorat) stands out prominently. Khorat benefits extensively from the easy access it has with the Central Plain; indeed, Bangkok is more easily accessible from most of the south and west of the province than it is from most of the northern parts of the Central Plain. Khorat town is the major rail junction for the Northeast and it is now linked to Bangkok both by the old 'Friendship'[84] Highway through Saraburi and by the new super-highway to Kabinburi and Sattahip.[85] The province has also developed processing facilities for peanuts and cassava on a scale not found elsewhere in the region.

Outside Nakorn Ratchasima, and particularly the southern and western districts of the province - Pak Chong, Pak Thong Chai, Chokchai, Si Khiu and Sung Ngern - it is only kenaf and to a lesser extent water melons which have been adopted

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84. So-called since it was built as a symbol of friendship between Thailand and the United States in 1957.

85. This road was built with the very important function of linking Khorat air-base with the supplies arriving at the port of Sattahip, a more overtly military construction than the Friendship Highway.

throughout the Northeast. Of these kenaf is much the more important, rising to a position of Thailand's third most important export earner in 1966 with a value of 1646 million baht.[86] Since then it has fallen back slightly and since 1968 has commonly ranked sixth behind rice, rubber, maize, tin and cassava products. In 1972-3 in fact rapidly growing sugar exports had pushed kenaf into overall seventh position.[87]

Native varieties of kenaf have been cultivated in limited quantities in Thailand for centuries, but commercial production was almost non-existent until the 1950s. Expansion began in this decade to supply the home gunny-bag industry, with cultivation initially centred on two areas, the North-eastern provinces of Chaiyaphum - Nakorn Ratchasima and Mahasarakham which together accounted for three-quarters of production in 1959. This early growth had been assisted by the dislocation which followed the division of Bengal in 1947 separating the jute of Pakistan from the processing facilities of Calcutta, but

> "..the event which really established the industry was the failure of the Pakistan jute crop which produced high prices in 1960 and still higher prices in 1961." 88

With this boom of 1960-61, the planted area in the other changwats expanded rapidly, but since that time the progress

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86. Chaiyong Chuchart, Normal L. Wake and Sachee Suthasathien, "An Economic Survey of the Production and Marketing of Thai Kenaf", Bangkok 1967, p.2.

87. Behrman, J.R., "Supply Response in Under-developed Agriculture: A Case Study of Four Major Arrival Crops in Thailand 1937-1963", Amsterdam 1967, Table IV-12, p.144.

88. Silcock, T.H., op.cit., p.78.

of the kenaf industry has been subject to alarming fluctuations. The actual market price for kenaf has continued to depend very much upon events in India and Pakistan (Bangladesh). India up to 1968 used Thai kenaf to supplement her own production and was Thailand's biggest customer in the boom years of 1965-66. Thereafter, although exports to India ceased, the purchases of Thailand's customers in Europe and Japan have continued to be highly influenced by the relative production and price of Indian and Pakistani jute. The price of Thai kenaf to the farmer has thus been subject to wild movements beyond his control and that of the Thai government.

The price fluctuations have in turn affected the area planted and the production in the Northeast region. The farmers of the Northeast, as Behrman notes, react very rapidly to price changes,[89] but it is impossible in farming to react immediately. A decision on whether or not to plant must be made on the basis of the previous year's profitability and the anticipation of the price to come. The Northeast farmer can have little guidance over this decision and has sometimes failed to take advantage of high prices as well as being hit by low prices.

On the other hand, it is clear that the cultivation of kenaf in the Northeast does not essentially affect the subsistence basis of the economy. Chaiyong et al. describe the position succinctly:

> "Production of kenaf is largely confined to the northeastern region where it has provided valuable cash supplements to rice farmers. Although it competes with rice to some extent for labour at harvest time, kenaf is an upland crop and does not replace rice from wet lowland soils." 90

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89. Behrman, op.cit., p.142.

90. Chaiyong et al., (1967), op.cit., p.2.

Nor does kenaf require any large-scale investment on the part of the farmer in the Northeast. As the crop expanded, there were still large areas of forested upland which could be cleared for its cultivation, a process requiring only the farmer's time and perhaps the hire of labour or a tractor to complete the job more rapidly. Hereafter no further expense is necessary unless further labour is hired for the onerous harvest and subsequent processing. Fertilisers are not normally used, although a little insecticide has been found to be a useful investment. Facilities for processing the kenaf have remained primitive and inexpensive; for the unpleasant task of soaking the stems to loosen the fibre, farmers have used small ponds, borrow pits from road construction or even the sides of paddy fields. Few have dug pits for the sole purpose of kenaf retting.

These minimal cash outlays have permitted farmers to easily enter into or withdraw from kenaf cultivation in the face of fluctuation in demand. Indeed, many farmers seem to see kenaf cultivation only in terms of a useful cash bonus. Should there be any question of competition for a farmer's time, it is always the kenaf which is relegated to second place to the advantage of the subsistence rice crop. Although in a year of favourable rainfall, kenaf will be planted with the earliest rains in March and April and will be cut before the paddy in September and October, in a year of uncertain rain, the two crops may in theory compete. To the farmer however there is no competition, for

> "..kenaf planting and harvesting have to be fitted into the framework imposed by

the system of rice production." 91

Thus if there is no early rain and the kenaf cannot be planted before the time for the preparation of the paddy, it may be abandoned or the field prepared very hastily. If it then competes with the paddy at harvest time, it is not unusual for the kenaf to be left in the field until the subsistence crop has been safely gathered in. It is then possible to cut the kenaf, but to the detriment of fibre quality and with the possibility that there will be insufficient water for retting. The same applies to another common practice of cutting the kenaf before the rice harvest but retting afterwards.

Much of what has been said about kenaf also applies to other crops which are expanding in the Northeast. The spread of maize, cotton and cassava has taken place on land which was not previously used, except perhaps under shifting cultivation, and could not be used for paddy land. In Khorat, maize has been often planted on quite steeply sloping land, especially alongside the new highway to Kabinburi. Moreover, although the area planted in the Northeast has expanded, this has not kept pace with developments in the Central Plain. In 1951 the Northeast had become the most important area for maize production with 138,000 of the 259,000 rai planted and 51.5% of the total production.[92] Since then it has lost ground to the competitive advantage of the northern Central Plain has become apparent and while the Northeast acreage has expanded to 639,000 rai in 1968, this only constituted 13.3%

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91. Ng, R.C.Y., "Some Land-Use Problems of North-East Thailand", Modern Asian Studies, vol.4(1), 1970, p.40.

92. NEEDPAG (1971), op.cit., pp.2-6.

of the total acreage in maize. Most of the expansion has been confined to Nakorn Ratchasima province with its loamy soils and splendid ease of communications with Bangkok.

The spread of cassava into the Northeast is of more recent origin. Cassava cultivation expanded in Thailand in the 1950s chiefly in the Southeastern provinces of Cholburi and Rayong. The planted area has steadily pushed northward into Chachoengsao province and it was from here, via the Sattahip-Kabinburi-Nakorn Ratchasima Highway, that cultivation spread to the Northeast region. Here there was originally a concentration along the highway in Khorat province, but a more recent upsurge occurred in 1972 in changwats Kalasin and Udorn Thani. Again expansion has been on upland areas, mostly previously uncultivated like the resettlement at Lam Pao in Kalasin, although in some places cassava is now competing strongly with kenaf.

It is clear, however, that maize and cassava, like kenaf before them, are not significantly affecting the basis of the Northeast's economy, the cultivation of a subsistence rice crop. In some cases, the farmers who have taken up these crops do not have any paddy land and they must sell the maize or cassava in order to buy rice. More usually, however, the crops are grown alongside the traditional rice crop. They provide an addition to the traditional economy and to that extent constitute a partial diversification of it; they have provided opportunities for the Northeasterner to earn some spare cash for the purchase of new consumer goods, without involving any real change of attitude.[93] With the exception

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93. Ng, R.C.Y., op.cit., p.36.

of cassava, which has a twelve month maturation period, these crops have not enabled the farmer to use his time nor his land more efficiently. The farm year remains concentrated in the months from April to December, usually with one or more slack months in the middle.

It may be said that these crops have at least introduced the Northeast farmer to the market economy on a more permanent basis than the irregular sale of surplus rice. This introduction, however, has not been without its difficulties. The vicissitudes of price fluctuations to which farmers have been subjected in growing kenaf may produce adverse reactions to other crops. At present both maize and cassava are not sufficiently widespread in the region to assess their general acceptability. Certainly both seem to have more stable, if rather narrow, market bases. NEEDPAG are optimistic about future prospects in the maize market:

> "Demand in the Far Eastern region will continue to grow, especially in Japan...as its demand for livestock food maintains its growth." 94

but it yet remains to be seen how much the Northeast region is likely to benefit from this following the retreat of the main planting areas into the Central Plain. Cassava also has its problems, mainly in terms of its effect on soil fertility. None of these alternatives seems likely to fundamentally assist the Northeast to revitalise its lagging agricultural economy unless in the context of an overall development strategy.

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94. NEEDPAG, Stage III, op.cit., pp.2-8.

The Prospects for the Northeast

The problems which face Northeast Thailand at present seem likely to worsen in the future if the present trends of development in the region are allowed to continue. The income gap between the region and the rest of Thailand is widening and the Northeast has no obvious immediate means of catching up. Its relative prosperity in recent years has been founded on an extension of the agricultural base. The development of new land for paddy has been at least partly responsible for the rise in production which has maintained the annual rice surplus. The development of cash crops has equally been founded on an expansion of cultivation onto upland soils not suitable for paddy. Extension of the Northeast's resource base in this way cannot be a long-continued trend and indeed NEEDPAG have suggested that at the present rate of development the cultivable land supply will be exhausted by 1984.[95] Moreover, the stability of the market for at least two of the present bases of the region's agriculture is very much open to doubt.

The Northeast has so far not been faced with any problem of land shortage, but if the present high level of population increase and rate of family formation continues into the future, the area of land available to each farmer is sure to decrease. To date, population pressure has only been felt in the densely populated river valleys, notably in changwats Roi-et, Mahasarakham and Sri-sa-ket. This has been solved by migration to the less densely populated provinces to the north, Udorn Thani, Khonkaen,

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95. NEEDPAG, (1971), op.cit., pp.2-19.

Loei and Sakol Nakorn.[96] Now the cultivable area in these provinces is also declining, the settlement of new land increasingly marginal. Sons are becoming less willing to set out in search of new land and increasing sub-division is taking place in the long-settled areas. The average size of holding in the Northeast is beginning to fall.

Clearly, if he is to maintain the present outlook of first and foremost seeking to satisfy family consumption requirements, the Northeast farmer will have to intensify his production on the smaller area available to him. However, for many farmers this will be a risky undertaking removing the element of insurance available to him from a larger holding. In conditions of rain-fed agriculture, the smaller or the less varied the holding, the greater the risk of crop loss in any one season. To reduce their holdings will make most farmers that much more vulnerable to the weather and that much less willing to invest heavily on their crop. Yet intensification calls for the application of greater cash inputs in the farm, of fertiliser or hired labour, insecticides or tractors. To invest heavily on a small area in these circumstances risks loss of crop, loss of investment and heavy debt, circumstances which have afflicted farmers in the Central Plain of Thailand for some time.[97]

These problems are likely to arise if no alternative strategy is developed for the Northeast and the mass of

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96. Ng,R.C.Y., "Recent Internal Population Movement in Thailand", Annals of the Association of American Geographers, vol.59(4), December 1969, p.723.

97. See Udhis Narkswasdi, "Farmer Indebtedness and Rice Marketing in Central Thailand", Ministry of Agriculture, Bangkok, 1964.

farmers continue to depend on subsistence rice cultivation. Intensification of this type is only possible where the resources allow and it has been seen that the physical resources of the Northeast region are such as to have discouraged farmers from this practice for centuries. A development strategy must be found which utilises what resources the Northeast does have and utilises them efficiently to promote economic growth.

What then are the resources of the Northeast region? It was noted above that the region may be divided physically into two areas, the large undulating tracts of open savanna forest and the narrow flood plains of the few major rivers. Each of these areas may be said to have certain resources for development. In considering rainfall, it was shown that the Northeast does not suffer notably from a shortage of rainfall for paddy cultivation in the course of a year, but that the problems were the erratic timing of the rainfall, the difficulty of storage in the highly permeable soil and flooding difficulties caused by rapid run-off. It was suggested that the alluvial soils of the Nam Mun, the Lam Chi and their major tributaries had the potential for much higher yields than at present if these problems could be controlled.

Since the 1950s the Thai government has sought to develop the potential of these river valley areas by the construction of a series of dams and diversion weirs in the Northeast designed to control the sudden floods and by storage to make the river water available for irrigation. In addition a project was set in motion for the construction of a mass of smaller tank projects to provide the same facilities for other smaller areas. By the end of 1969, the major state irrigation projects

in the Northeast, either completed or near completion, provided for a potential irrigable area of 2,382,000 rai, while tank projects were designed to irrigate another 703,000 rai.[98] The location of the major projects in the Northeast is shown on Figure II-14 and an estimate of their individual capacity in Table II-11 .

These irrigation projects will have two main purposes. By ensuring that farmers receive an adequate water supply for rice cultivation even in the driest wet season or by allowing a degree of drainage off the land in seasons of heavy rainfall along with the regulation of river flood, these projects provide regular environmental conditions for the wet season crop. Thus the farmer, able to rely on adequate water control, should be more willing to invest heavily in the requirements for increasing the intensity of cultivation and for producing a significant increase in yields. Greater control of water should allow him to use the higher-yielding seed varieties; he can be assured that investment in fertilisers and insecticides will give him an adequate return on his investment.

By ensuring his subsistence crop, probably from a much smaller area of land, the provision of irrigation to the farmer should serve a second purpose, namely to encourage the diversification of the cropping pattern. Unless the farmer seeks to grow rice for sale, he may have land available for other crops during the wet season. In addition, most of the major projects are planned to provide irrigation water to at least part of the area during the dry season, and further diversification should come about then. Thus the farmer in the

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98. Ministry of Agriculture, "Agricultural Statistics of Thailand 1970" , Bangkok 1971, pp.129-140.

FIGURE II - 14 : NORTHEAST THAILAND - RESERVOIRS AND IRRIGATION PROJECTS

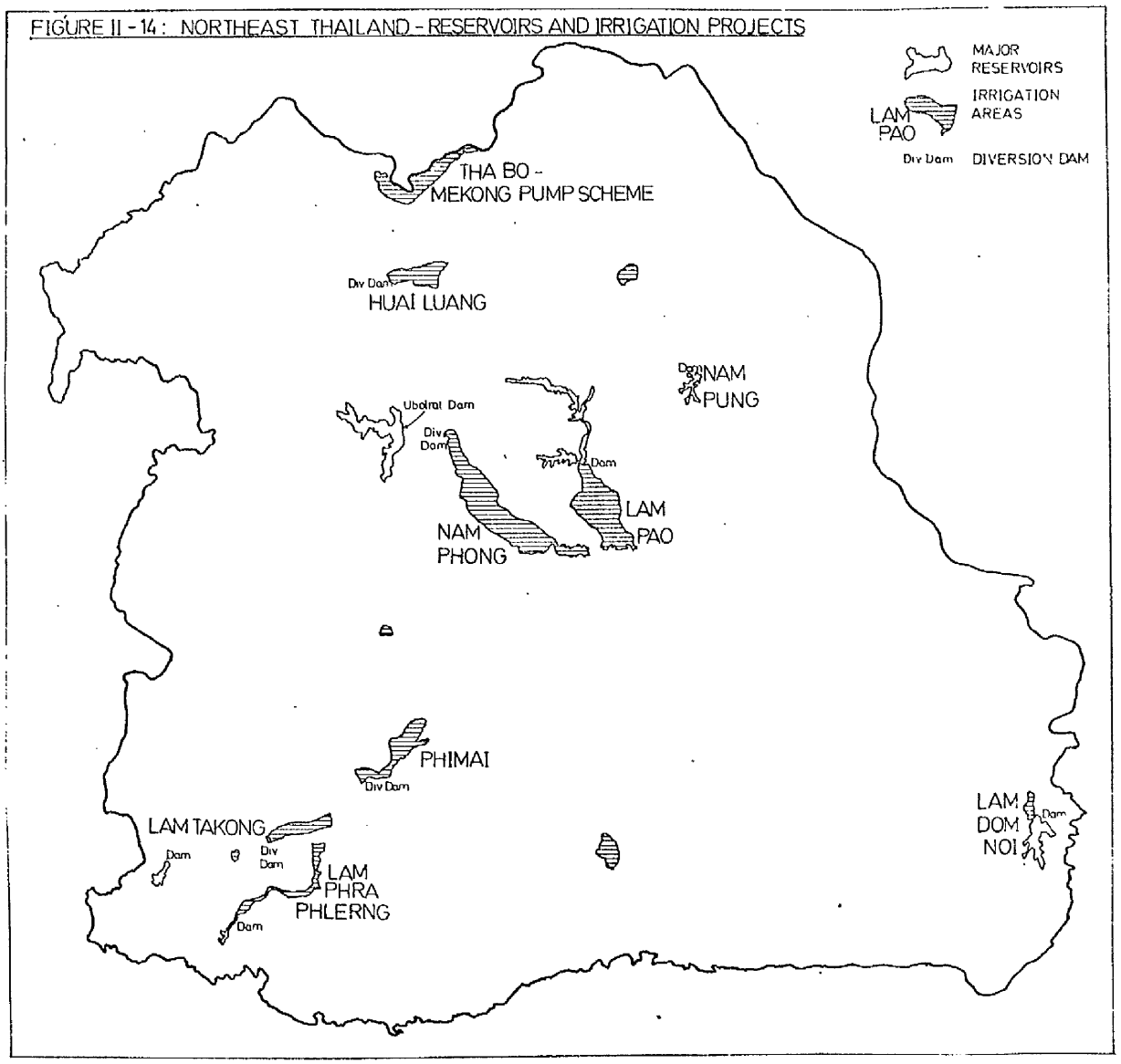

TABLE II - 11

Northeast Thailand: Major Irrigation Projects

Summary Characteristics

AREA & PROJECT	PROVINCE	TOTAL AREA (000 RAI)	IRRIGIBLE AREA (000 RAI)	COMPLETION DATE	FUNCTION
MEKONG BASIN					
HUAI LUANG	UDORN	92	52	1976	S.I.F. *
MEKONG	NONGKHAI	119	108	1975	S.I.F.C.
SONGKHRAM	SAKOL NAKORN	276	67	1976	S.I.F.D.
OTHERS		31	30		
		518	257		
CHI BASIN					
UPPER CHI	KHONKAEN	284	267		S.I.
NAM PONG	KHONKAEN	307	87	1976(?)	S.I.D.
LAM PAO	KALASIN	361	84	1975(?)	S.I.F.D.
NAM YANG	KALASIN	41	29	1973	S.I.
		993	467		
MUN BASIN					
LAM PHRA PHLERNG	KHORAT	81	62	1973	S.I.F.D.
LAM TAKHONG	KHORAT	123	115	1974	S.I.F.
LAM CHI	SURIN	63	53	1975	S.I.
LAM SIAO	M'KHAM	63	38	1973	S.I.
LAM DOM NOI	UBOL	150	-	1976	P.D.
MUN RIVER	UBOL	214	212	1963	S.I.C.
OTHERS		108	54		
		802	534		
TOTAL NORTHEAST		2,313	1,258		

Source: Ministry of Agriculture: Agricultural Statistics of Thailand, 1974, Table 75, pp. 151-156

* S = STORAGE, I = IRRIGATION, F = FLOOD CONTROL, C = CONSERVATION, D = DRAINAGE, P = PUMPING

the irrigated area will be able to use his land and labour more efficiently throughout the year.

The provision of irrigation facilities is crucial for the development of the potential of the valley lowlands of the Northeast. As a developmental policy on its own, however, it does not solve all the problems and, indeed, creates others. Such a policy, in so far as it favours a select group of farmers inside the irrigation project, is likely to produce inequality between those farmers inside the project and those outside, not only between villages or groups of villages, but also within individual villages. Moreover, although irrigation creates the means whereby the traditional system can be diversified, it does ask the question of which crops should be developed in the context of the Northeast with its relative disadvantage vis-a-vis the Central Plain of Thailand. Clearly the first problem must be solved by developing a programme also for the non-irrigible areas.

If the main resource potential of the lowlands lies in its fertile rice land, that of the rest of the Northeast is the vast area of open forest and grazing land. Platenius estimated that in 1963 some 61.5% of the total land area of the Northeast was occupied by forests and grazing land[99] although some of this has since been cleared for upland cropping. Some of the Northeast's forest area is dense monsoonal forest, but there are still large areas of more open forest land in which livestock at present graze. Moreover, the Northeast has traditionally been

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99. Platenius, Hans, "The Northeast of Thailand: its Problems and Potentialities", NEDB, Bangkok 1963, p.6.

the major area of livestock rearing in the country and, although figures are subject to large year-to-year fluctuations, it still held an important position in the Thai livestock industry in 1970. (Table II-12). Traditionally the region exported large numbers of cattle and buffalo to the Central Plain for draught purposes and, although that area's demands have declined with the adoption of greater mechanisation, the increased consumption of meat in the Thai diet means that there is still a substantial domestic market for the Northeast's produce.

Estimates of demand are difficult to obtain, but it seems there is now some shortage of beef in Thailand. The National Economic Development Board noted that in 1968 40 tonnes of best beef were imported into Thailand.[100] NEEDPAG[101] have produced an analysis based on the National Statistical Office Household Expenditure Survey from which they estimate the number of livestock of different types needed to fulfil the whole kingdom demand in 1970. If one compares this estimate with the actual numbers slaughtered in 1970 as recorded by the Livestock Department, it is clear that there is ample scope for production increases in all sectors. (Table II-13).

Although these figures are only general estimations, it seems certain that the Northeast could well have an expanding market for its livestock products in the immediate future in Thailand itself. Moreover there are possibilities of overseas sales. NEDB note that

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100. NEDB, Agricultural Development Strategy Sub-Committee, "Agricultural Development Strategy for Thailand", Bangkok 1969, p.22.

101. NEEDPAG, 1971, op.cit., pp.2-31, 32.

TABLE II - 12

Northeast Thailand : Livestock Totals as Percentage of Whole Kingdom
1957 - 1972

	Buffaloes		Cattle		Pigs	
	Number (000s Head)	Percent of Total	Number (000s Head)	Percent of Total	Number (000s Head)	Percent of Total
1957	2229	50.1	1575	46.9	728	24.8
1959	2365	50.3	1584	46.0	806	26.0
1961	2509	50.5	1594	45.0	892	27.1
1963	2637	51.2	1580	43.6	987	30.1
1965	2786	52.6	1663	42.8	1092	29.4
1967	2945	53.9	1751	41.9	1209	28.6
1969	3112	55.1	1801	40.5	1338	27.8
1970	3196	55.7	1892	40.5	1405	27.4
1972	2828	57.4	2007	46.0	1962	42.9

Source : Ministry of Agriculture, "Agricultural Statistics of Thailand 1972-73", Bangkok 1974, Table 35,pp.78-80.

> "A lot of buffalo meat can be sold overseas because the average price per kilo is low. At present there are not sufficient numbers for sale and the quota system of approximately 50,000 buffaloes was put into effect. The overseas demand, however, is many times more than this." 102

NEEDPAG also note demand for pigs and poultry in Hong Kong and Singapore[103] and one may perhaps assume a shortage of draught animals in Vietnam, Cambodia and Laos following the war devastation.

In order to take advantage of this situation, however, the Northeast must take drastic steps to improve its traditional methods of husbandry. Generally the cattle and buffalo are allowed to forage wherever they wish on pastures of little nutritional value; the beasts themselves are of poor quality and suffer badly from disease,[104] although that scourge of African husbandry, sleeping sickness, is not present in Thailand. Fortunately extensive programmes have been suggested to improve this situation and experiments are already under way. Tests on pasture improvement have been conducted at experimental stations in the Northeast and at Khonkaen University[105] and a recent I.B.R.D. study has called for the spread of Brahman bulls, artificial insemination, vaccine development and the training of veterinary staff.[106] This study also calls for the initiation of experiments on mixed crop and livestock

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102. NEDB, 1969, op.cit., pp.22-23.

103. NEEDPAG, 1971, op.cit., pp.2-33.

104. Although many farmers are now replacing their native stock with Brahman crossbred stock.

105. New Zealand Colombo Plan Notes, No.4, Khonkaen 1971.

106. Brumby,P.J. and Baker,J., "Thailand: Livestock Reconnaissance Mission. Back to Office and Full Report." I.B.R.D. Washington 1973, mimeo. pp.1-2.

TABLE II-13

Thailand : Estimated Livestock Consumption Requirements and Numbers Slaughtered 1970

	Cattle	Buffaloes	Pigs
Estimated Home Consumption Needs	417,143		3,114,286
No. Slaughtered	248,140	87,165	1,481,700
Balance	- 81,838		- 1,632,586

Source: N.E.E.D.P.A.G., "Northeast Thailand : Recommended Development Budget and Foreign Assistance Projects 1972-76", Bangkok 1971, p. 2-31.

farming with such innovators being given credit facilities to assist them.[107]

In this suggestion we may perhaps find some answer to the problem of the Northeast as a whole. If the livestock programme can be successfully developed this may also help to solve the problems of the irrigated areas. These could benefit from the growth of a market for the production of irrigated fodder crops such as corn or sorghum or oil-seeds, like castor, sesame or peanuts. These crops might be processed in the Northeast for sale as protein foods to the cattle farmers, to the advantage of both types of area. This is not to say that other specialised crops will not be grown in these areas, nor that an export component is ruled out. It only serves to suggest the possibilities for integrated development in the Northeast which seems necessary if the region is to move forward.

It is clear however that, for such a scheme to succeed, both components must be capable of advance and it seems at present that, while the programme for upland areas is only just beginning, the irrigated areas, despite their relatively long development, are experiencing grave problems. Unlike their counterparts in the Northern region, the farmers of Northeast Thailand have had no previous experience of the requirements of an irrigation system. At the same time, as a result of the Northeast's long isolation and neglect, they are less accustomed to the ways of commercial agriculture than are the farmers of the Central Plain. The transition from rain-fed, semi-subsistence agriculture to irrigated commercial agriculture will be difficult for such farmers. It involves a fundamental

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107. Ibid., p.3.

transformation of the environment, of the existing economic system and of the farmers' attitude to both. It may be expected that the latter change will, in particular, take time to come about. It is with these aspects of the region's economic development that the remainder of this study is concerned. It recognises that this is not the only problem to be faced in the Northeast, but it is an important one, for if the farmers in the irrigated areas cannot make the transition there must be doubts about its whole economic future.

The recognition of the problems of these farmers has led to studies from a number of sources, notably in the planned development of the Lower Mekong Basin. To date, investigations have been of two chief types. The Mekong Committee (Committee for the Co-ordination of Investigations of the Lower Mekong Basin) has instituted a number of socio-economic benchmark surveys of selected projects in the Northeast which have presented rather skeletal findings of summarised data.[108] A second group of studies have been mainly instituted via the United States Operations Mission and involve generalised analyses of the human and organisational problems of development in operational and potential project areas in the Lower Mekong Basin, sometimes in comparison with older irrigation projects of the Central Plain and Northern regions of Thailand.[109]

The present study seeks to combine something of the two approaches. It is recognised that there are agronomic and

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108. See bibliography, e.g. Mekong Committee, Chamlong Tohtong.

109. See bibliography, Ingersoll, Frutchey, Kaufmann, USBR.

economic problems, such as the question of marketing, which are highly important in the transition from subsistence to commercial agriculture, but the present study concentrates on the difficulties farmers encounter in the organisation of their resources in response to the new opportunities presented by irrigation. In this context it examines the hypothesis that economic development produces an element of social and economic inequality in that the farmers involved have differing abilities to respond to their opportunities. It goes on to assess the ability of supposedly egalitarian farmers' associations to assist their members in the course of the transition with the minimum of social disturbance. This approach follows broadly the second group of studies mentioned above, but the study makes use of data gathered in the field to attempt a more detailed analysis of the problem.

The context of the study is the Lam Pao Irrigation Project, one of the largest in the Northeast region, although comparisons are made with work done in other areas. The data used are partly those collected by the writer during field work in the area, partly material gathered in the wider context of the Lam Pao Land Use Survey collected by a team from the School of Oriental and African Studies, University of London who are involved in a five-year monitoring study in the area. The nature of this data and the general conditions in the Lam Pao Irrigation Project area are presented in the following chapter.

CHAPTER III

THE SURVEY AREA AND METHODS OF SURVEY

The Lam Pao Irrigation Project Area

The Lam Pao Irrigation Project is the largest of the state irrigation projects in Northeast Thailand. It was begun in 1958 by the Royal Irrigation Department of the Royal Thai Government and was scheduled for completion in 1972. This intended completion date has now been extended to 1980.

The project is one of a number of schemes on tributary streams of the Mekong drainage system in Northeast Thailand. The schemes themselves are intended to reduce environmental hazard within the valleys of the region through flood control and water storage for irrigation, but at the same time, and along with similar projects in Laos, the Khmer Republic and Vietnam, they should provide valuable information for any future implementation of large-scale projects on the Mekong river itself as envisaged by the Mekong Committee of the Economic and Social Commission for Asia and the Pacific (E.S.C.A.P.). Thus the tributary projects have been incorporated within the work of that organisation.

The Mekong Committee has proposed a series of projects designed to regulate the flood level of the Mekong main stream, some of which also have a considerable capacity for hydro-electric power generation and for the provision of irrigation water. For the most advanced of these projects,

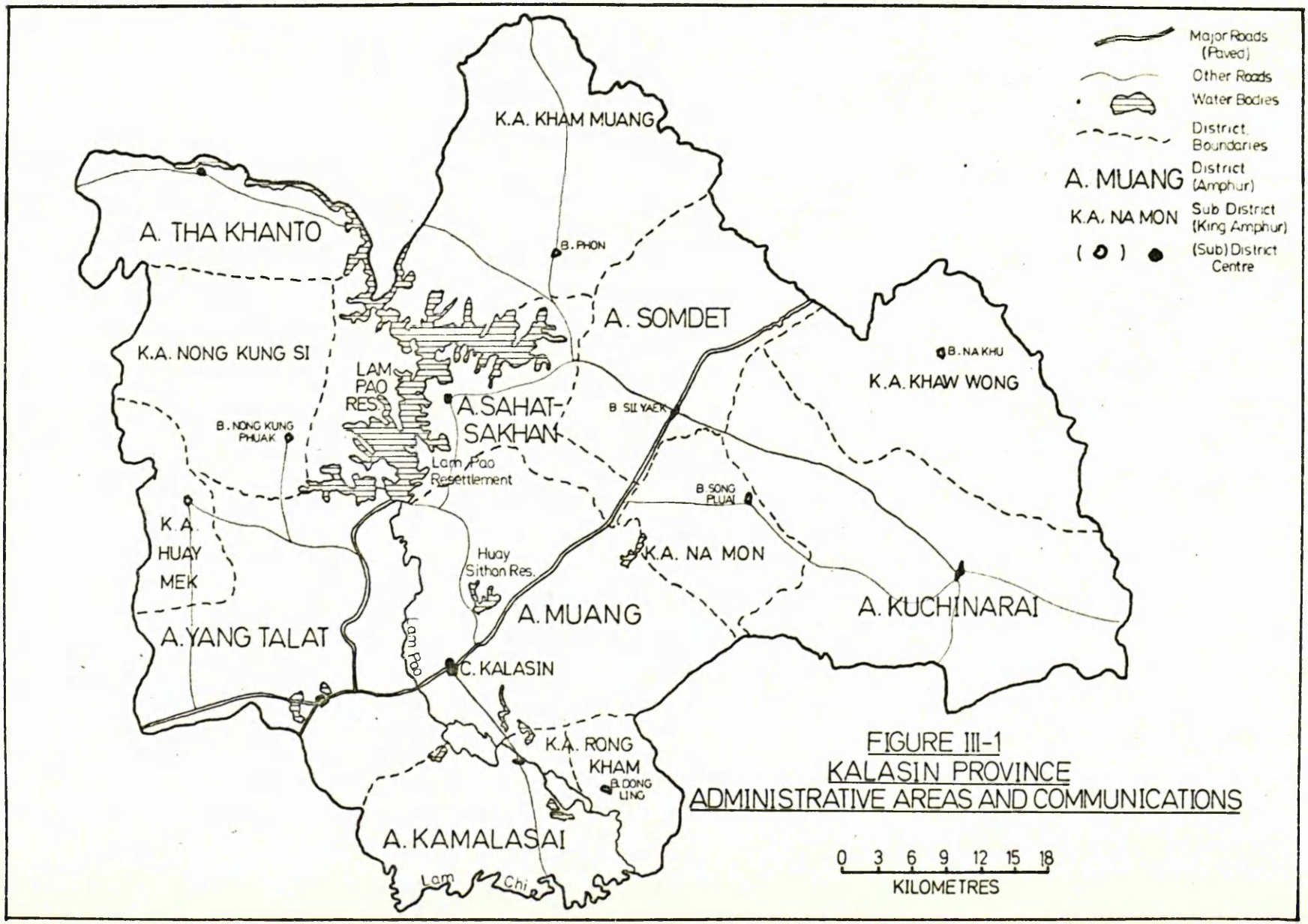

FIGURE III-1
KALASIN PROVINCE
ADMINISTRATIVE AREAS AND COMMUNICATIONS

detailed feasibility studies are being prepared.[1] If political conditions and the availability of finance allow, earliest implementation is likely to be given to the major dam at Pa Mong, upstream of Vientiane on the Thai-Laotian border. Besides its importance for flood control and its massive hydro-electric potential, this scheme is capable of irrigating large areas of Thailand's Northeast region. This means that the implementation of that region's tributary projects and studies of the process and problems of development therein are particularly vital at the present time.[2]

The Lam Pao Irrigation Project is situated on the Lam Pao river, a major tributary of the Lam Chi, in Kalasin province in the central part of the Northeast region. (Figure III-1). The project was planned to provide irrigation water and associated control of flooding in the drainage basin of the Lam Pao by impounding the waters of the Lam Pao river and a smaller stream, the Huay Yang, behind an earthfill dam some eight kilometres long, a length necessitated by the complex topography of the dam site. The lake formed behind the dam extends in a sinuous manner northward as far as the neighbouring province of Udorn Thani, giving a total storage capacity of some 1,420 million cubic metres.[3] From the

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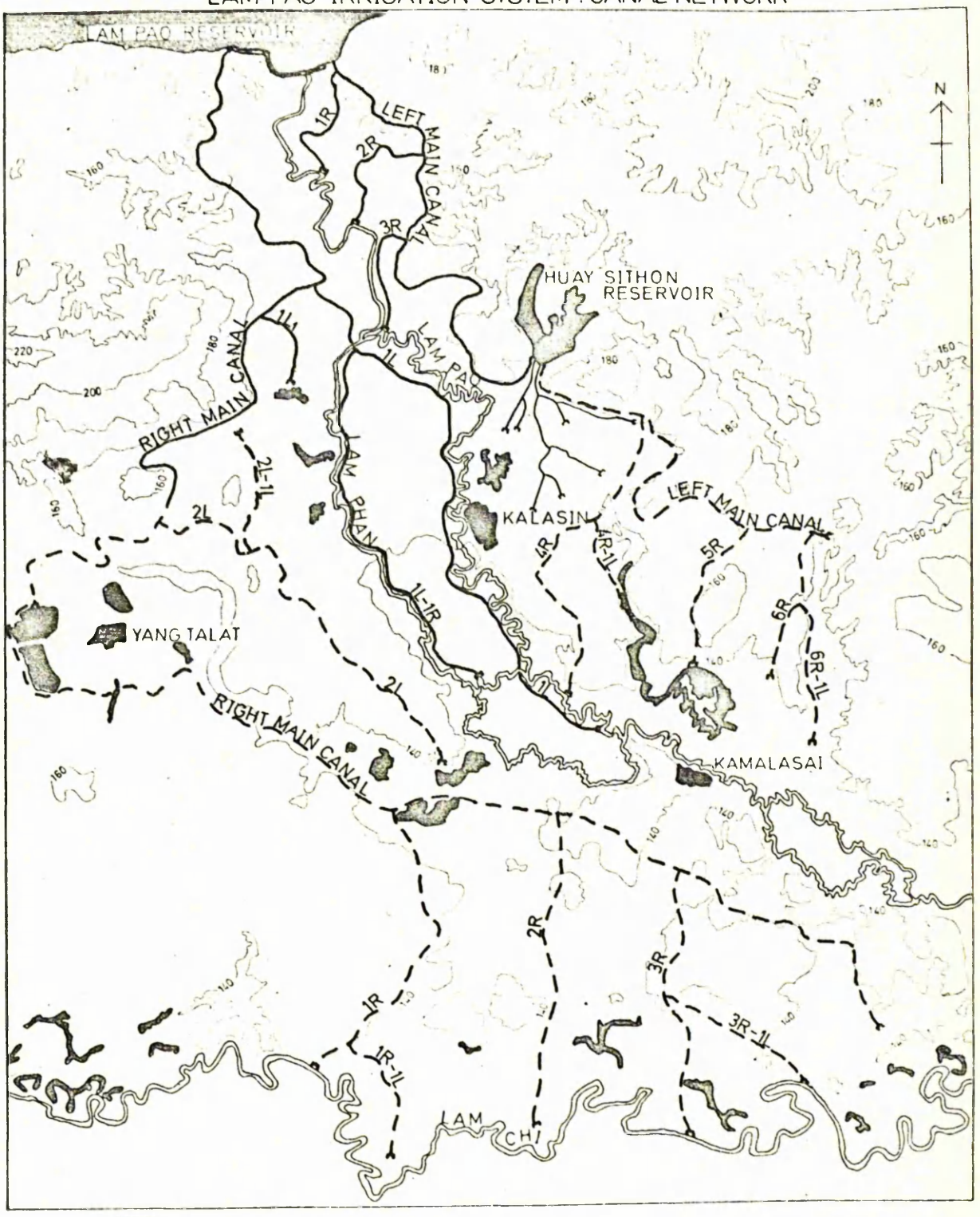
1. For the projects at Pa Mong, Sambor, Tonle Sap and the Mekong Delta.

2. With the Communist takeover in Laos, the Khmer Republic and the Republic of Vietnam in the course of 1975, problems of co-operation between the beneficiary members of the Mekong Committee have grown. There seems little immediate prospect of mainstream development, but at the same time greater attention has perforce been given to the Thai tributary schemes and their problems.

3. A live capacity of about 1,100 million cubic metres.

FIGURE III-2
LAM PAO IRRIGATION SYSTEM : CANAL NETWORK



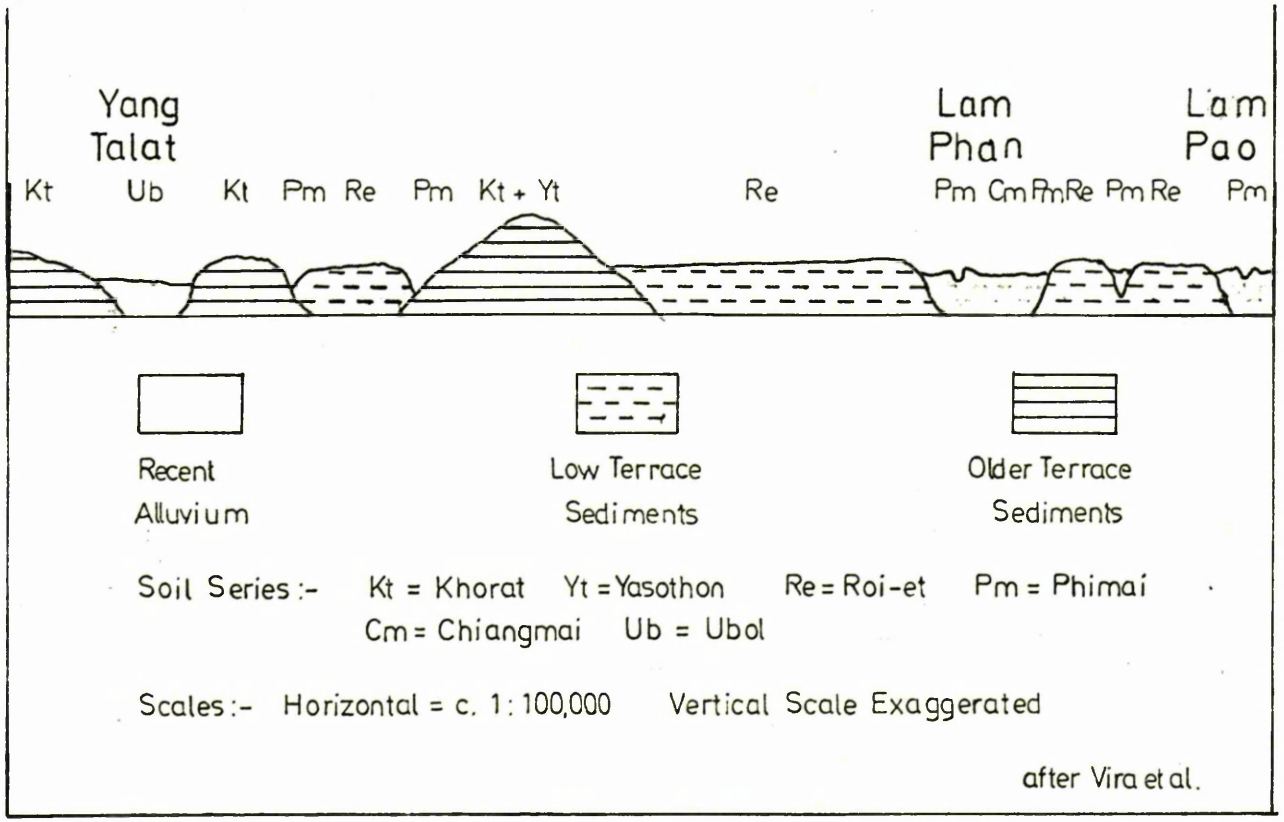
reservoir some 125 kilometres of canals will lead water to an irrigible area extending to 338,000 rai (54,000 hectares) in the wet season and to 254,000 rai (40,500 hectares) in the dry season. Construction of the dam started in 1963 and was completed in 1968. Since then work has progressed only slowly on the distribution system, causing the re-scheduling noted above.

The project is planned in three stages, two on the right bank of the Lam Pao and one on the left bank. At present the distribution system for the Right Bank Stage 1 system is all but complete and has been transmitting irrigation water to a growing number of farmers since the 1969-70 crop season. When fully operational, this stage should serve 100,000 rai of irrigated land. As of early 1975 the construction of the Left Bank Stage 1 system has not progressed very far; the Left Main Canal has been extended to its junction with the existing Huay Sithon tank north of Kalasin town, but little of the planned irrigated area of 88,000 rai has so far been served. Construction on the Right Bank Stage II system, covering about 150,000 rai, is now scheduled for 1977-80. The main features of the irrigation system are presented on Figure III-2.

The Lam Pao project area extends some 45 kilometres from north to south and at its widest stretches 35 kilometres from east to west. The dam site is situated at an elevation of 160-165 metres above sea-level, with the high-water level in the reservoir itself 162 metres. From here the area served by the irrigation system slopes down to the Lam Chi flood plain, where an extensive area of flood plain has an elevation of only 136-137 metres. As Figure III-3 shows,

FIGURE III-3

LAM PAO VALLEY (RIGHT BANK) : GEOLOGICAL STRUCTURE



the area is composed of a series of river terraces of the Lam Chi-Lam Pao system, three of which are normally present in the basin, but which in the Lam Pao area are confined to the Upper and Lower terraces with the Middle terrace absent. In the northern part of the project area, from the dam site to about kilometre 19 on the right main canal, around the villages of Ban Tum and Ban Chiang Ngam (see Figure III-4), and to about the Huay Sithon reservoir on the left main canal, the upper terrace forms a series of high ridges separated by narrow valleys like that of the Huay Yang. (Plate III-1). South of this line, the upper terrace occurs only in isolated knolls and ridges about 5-20 metres above the general 140 metre level of the low terrace which forms an extensive plain.[4] Most important of these ridges of upper terrace is that which extends from kilometre 21 on the right main canal along the western side of the second left lateral.[5]

> "The low terrace is remarkably flat...Here old river channels are clearly visible while (sic) examining the airphotos. In the fields on the contrary, such channels...can hardly be recognised." 6

The low terrace is interrupted by the narrow flood plains of the Lam Pao and its main distributary, the Lam Phan, only a few metres below the low terrace level. (Plate III-2). To the south these areas of alluvium gradually open out onto the more extensive flood plain of the Lam Chi, although this

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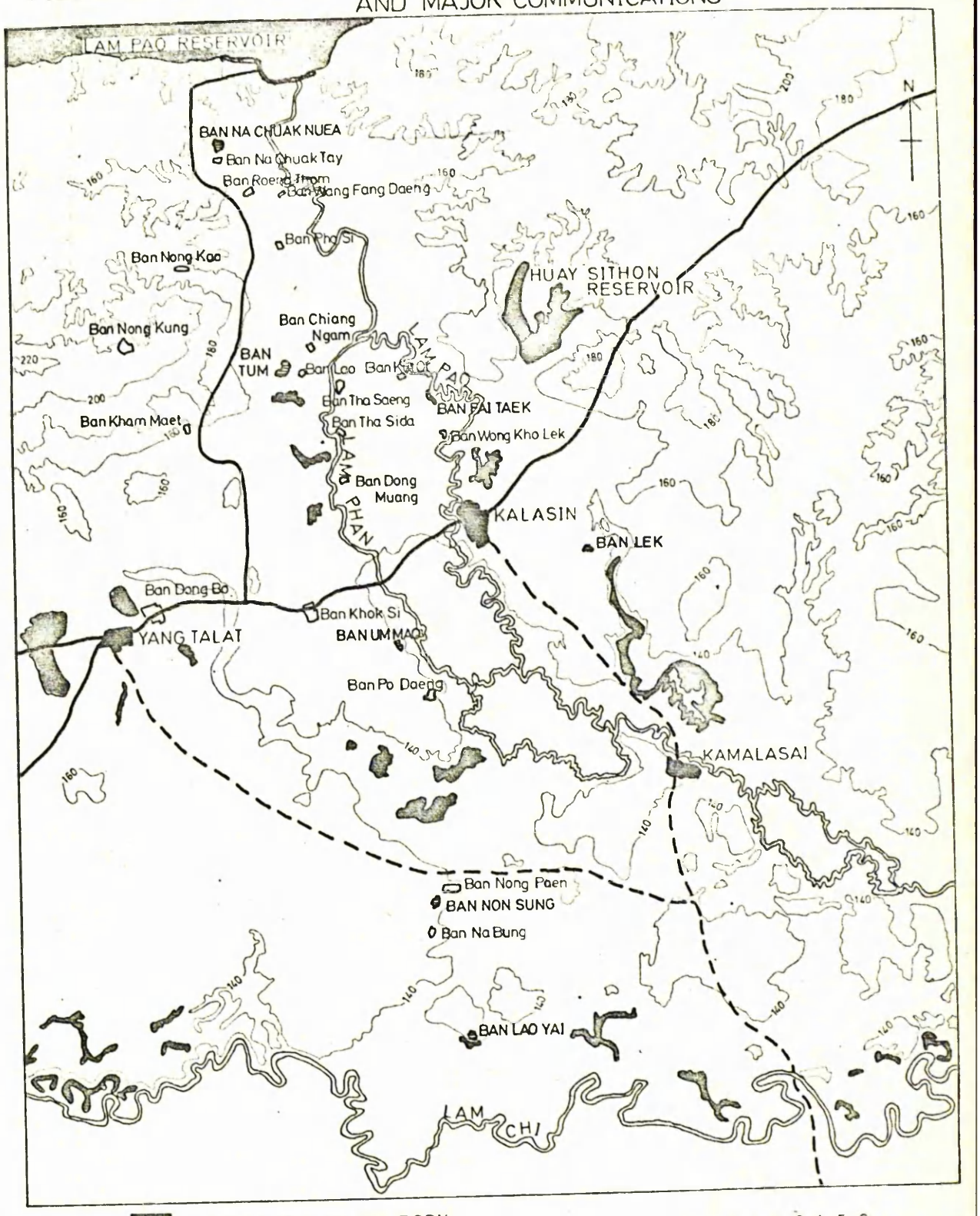
4. Vira Poomvises, F.R.Moorman and Sarot Montrakun, "Detailed Reconnaissance Soil Survey of the Lam Pao Irrigation Project (Kalasin Province)' Ministry of National Development, Bangkok, 1963, p.2.

5. Engineering Consultants Incorporated, "Lam Pao Irrigation Project: Land Classification." Royal Irrigation Department, Bangkok 1972, Volume 1, pp.111-2.

6. Vira et al., op.cit., p.3.

FIGURE III-4 : LAM PAO IRRIGATION AREA LOCATION OF VILLAGES AND MAJOR COMMUNICATIONS



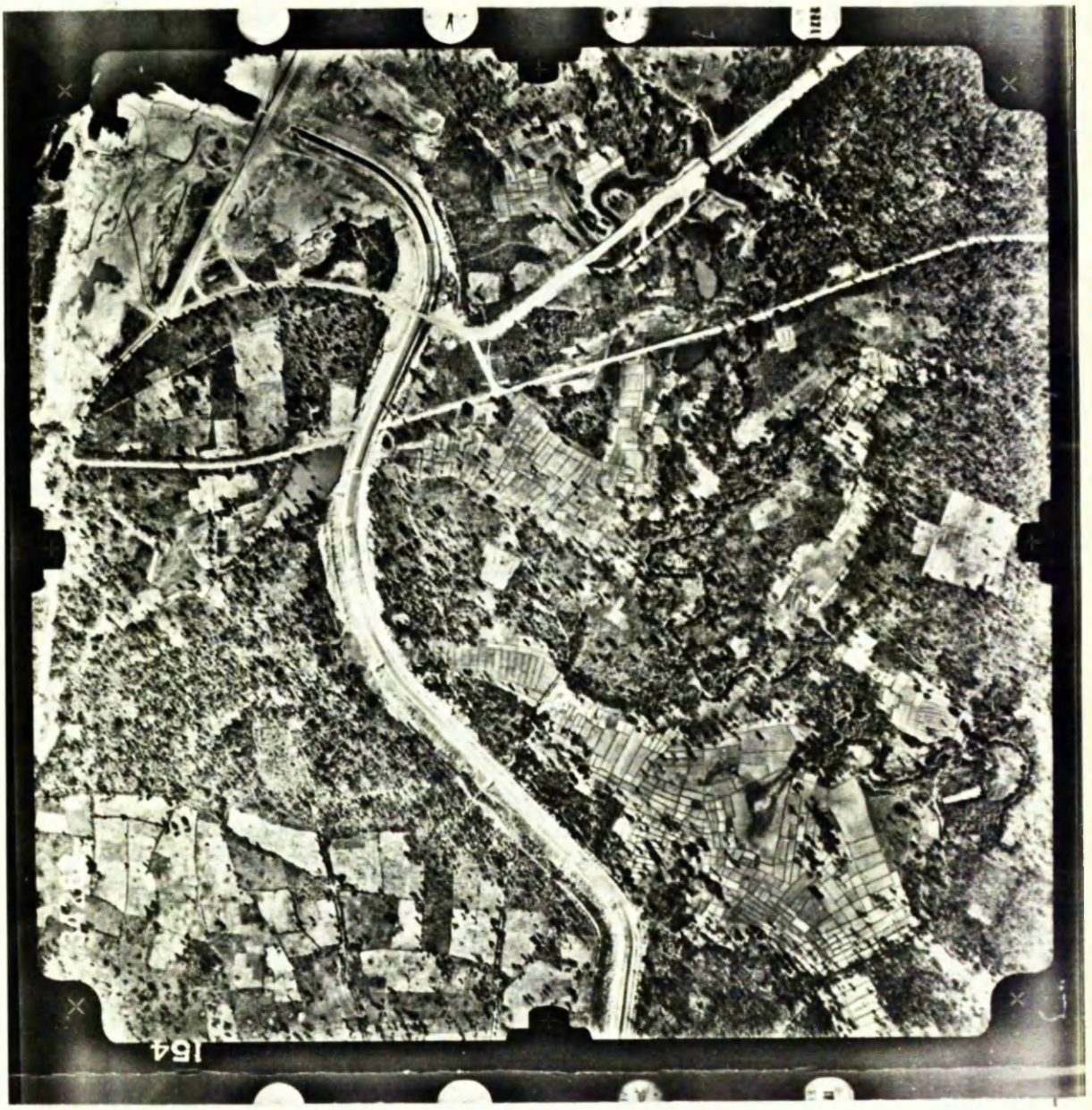


PLATE III-1 North of Ban Na Chuak Nuea, showing the outlet of the Right Main Canal and the sinuous course of the Huay Yang. The higher ground to the west of the canal, with the large upland plots, contrasts with the small area of padi fields in the narrow valley of the Huay Yang.

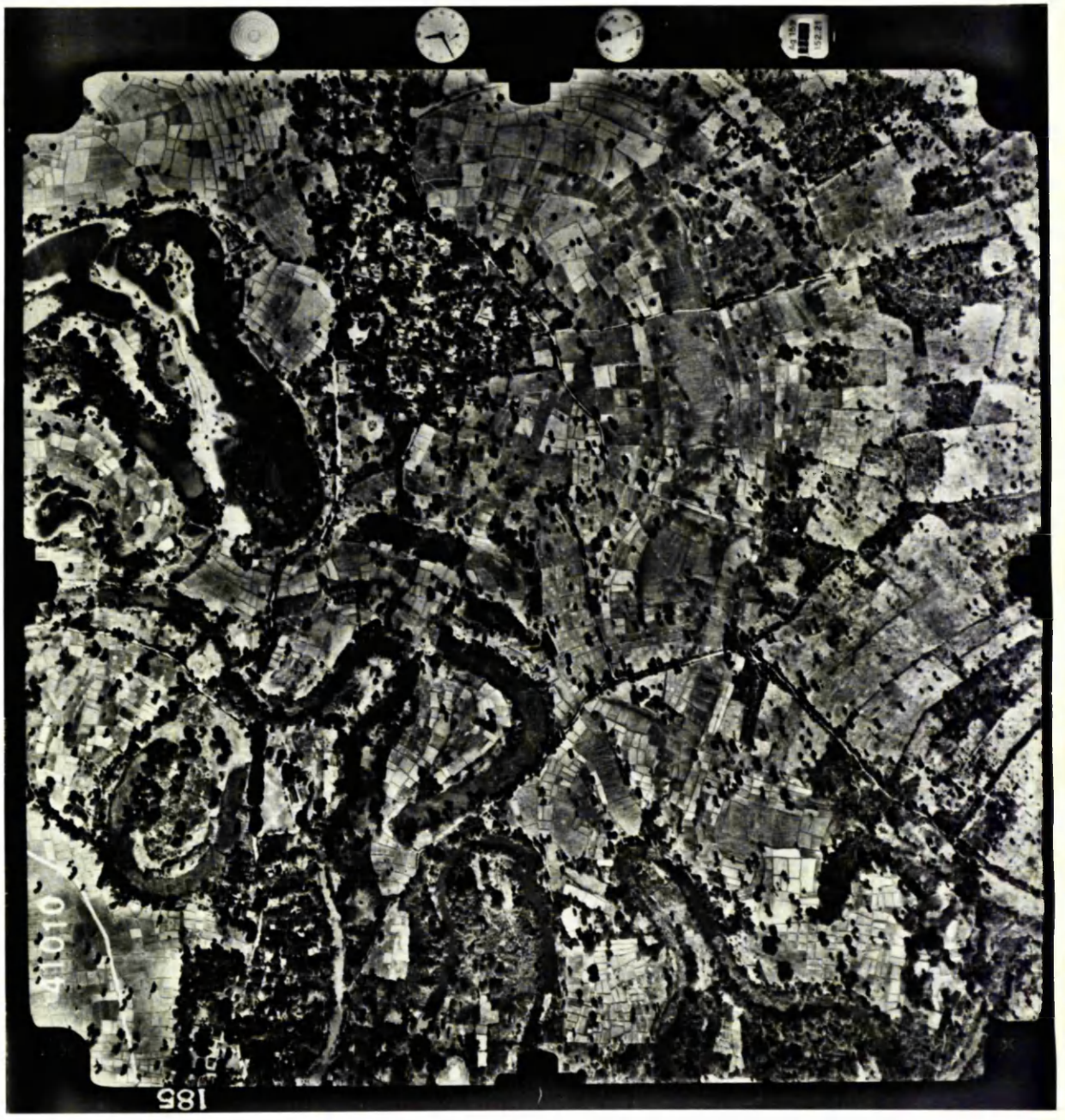


PLATE III-2 The Lam Pao floodplain near Ban Fai Taek. Note the abandoned meanders, some already reclaimed for agriculture. This branch of the river is only used in times of flood. Fai Taek village may be seen in the extreme southwest of the photograph, along with the course of the 1L lateral canal.

too is only marginally higher than the extensive remnants of low terrace which constitute both village sites and important areas of rather higher land used both for rice and upland crops. (Plate III-3).

As may be imagined the general slope of the project area is very gentle. Surveying only the right bank stage 1 area, Engineering Consultants noted that 86% of the area had slopes of less than 2° and most of this was less than 1°. Only in the extreme northern part, in the area of high terrace, do gradients exceed 5°.[7]

The rivers themselves have well-defined channels but the Lam Pao - Lam Phan system is unstable and local incised stretches occur as well as vestiges of recent shifts in course as noted above. Natural levees occur along the Lam Pao and the Lam Phan and at a larger scale on the Lam Chi. These vary in width and are quite low, that of the Lam Chi being only 2 metres higher than the flood plain behind it. In recent years, the Lam Pao branch of the tributary river has been progressively silting up, so that, more and more, the water has to pass through the Lam Phan, which until the dam was constructed was unable to carry all the water during high floods. The silting up of the Lam Pao and the associated flooding Vira attributes to the clearance of the open dipterocarp forest which covered the higher land until the 1950s. (Plate III-4). Comparing the situation in 1962 with that on aerial photographs taken in 1954 he comments

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7. Engineering Consultants Incorporated, op.cit., p.III-3.

PLATE III-3 The Site of Ban Lao Yai. The village lies on an area of terrace northeast of the centre of the photograph and is heavily wooded. To the south is the Lam Chi floodplain, almost completely flat, but including the shallow lake (nong) to the south of the village.

PLATE III-4 Forested and Cleared Upland, West of Ban Tum. The photograph shows the transition from the padi-land to the east of the canal up the gently sloping upland onto the forested ridge. The access road to the damsite crosses the upland.

> "It has been observed that a very large part of the land under forest in 1954 has since been cleared...especially for the growing of kenaf...Forest regeneration in these parts is very slow..leaving the lands subject to the destroying actions of both the sun and the battering rains." 8

The 'battering rains' follow closely the rainfall regime of the Northeast region already described.[9] A number of rainfall stations have been established by the Royal Irrigation Department at district centres in Kalasin province and at the Lam Pao dam site. Although they have been collecting for a shorter period than the standard Meteorological Department stations, they do show the same general characteristics. Rainfall in the Kalasin area appears to be rather lower than in some parts of the Northeast, but higher than in the adjacent province of Khonkaen.[10] (Table III-1).

Although the annual percentage variation of the rainfall in the district centres in Kalasin province is only in the order of 15%, it is once again its variability at crucial times of the agricultural year which is the more important characteristic. Rain falls on a remarkably low number of days each year, although the figure seems to be increasing since the construction of the reservoir, and usually in the form of localised but heavy showers. As daily rainfall statistics demonstrate, a day of heavy rain in one part of the area is not necessarily so in another locality. Such variability is particularly important in the months of land preparation. Figures for the rainfall station in Kalasin

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8. Vira et al., op.cit., p.7.

9. See below, Chapter II.

10. Engineering Consultants Inc. op.cit., p.III-5.

TABLE III - 1

Kalasin Districts and Surrounding Provinces

Mean Annual Rainfall 1953-70

(millimetre)

STATION	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
YANG TALAT	1334	227.2	17.0
KAMALASAI	1343	239.2	17.8
MUANG KALASIN	1237	182.0	14.7
UDORN THANI	1537	249.2	16.2
ROI-ET	1400	201.1	14.4
KHONKAEN	1208	N.A.	N.A.

Source: Royal Irrigation Department

town have already been presented,[11] indicating a possible 50% variability in the land preparation months of May and June, and the records at Yang Talat and at Kamalasai are of a similar order.

Engineering Consultants have cited work carried out at the Sam Chuk experimental station in changwat Suphanburi in the Central Plain to assess the water requirements for paddy cultivation,[12] which have suggested that for seed bed preparation early season rainfall of between 150-200 mm. is required. For the initial tillage of the paddy plots, the total is estimated to be of the order of 400 mm. of rainfall.[13] The actual amount required admittedly depends on the texture of the soil in question and whereas that at Sam Chuk was finely textured, many of the soils of the Northeast are rather more coarse grained. Nevertheless, making allowances for this difference and examining the rainfall records of the Lam Pao area, Engineering Consultants have observed that

> "On the average, there should be enough rainfall by the middle of May to start tillage in paddy preparation." 14

Of course, average conditions are of little relevance to the farmer and the above report recognises the fact. Nevertheless they maintain that even for 20% probability low rainfall in May, about 110 mm. the rainfall should be adequate

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11. Chapter II, Table II-8.

12. Kung, Peter and Charin Attayodhin, "Water Requirements in Rice Production", Royal Irrigation Department, Bangkok, undated.

13. Engineering Consultants Inc., op.cit., volume II, p.83.

14. Ibid., p.88.

to moisten the soil suffiently for tillage. Indeed they go so far as to suggest that irrigation water should not normally be necessary during the May-June period. [15] This statement is based on the expectations of 20 percent probability rainfall in May (110 mm) and 50 percent probability rainfall of 160 mm. in June and would seem to be eminently reassuring to the farmer. However, a closer examination of the rainfall records for the three district stations in Kalasin province indicates that such an analysis may not be over-helpful.

These figures raise a number of important points. First a comparison of the three stations indicates that the amount of rainfall received can vary over a very short distance. Although the stations in Kalasin and Kamalasai are only some ten kilometres apart, rainfall received in any particular month may vary by as much as 100mm. and frequently does so. Second, there are a number of years in which neither the 20 percent probability May rainfall nor the 50 percent probability June rainfall is recorded, and in which even by the end of July the cumulative 400 mm. of rainfall estimated as required for paddy cultivation has not been received. [16] Third, it is as important for the rainfall to arrive regularly as it is to receive the correct amount; if farmers are persuaded to begin preparation early following heavy rains and these are followed by a period of drought,

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15. Ibid., p.89.

16. The first situation was experienced in Kamalasai in 1958 and in 1967 and in Yang Talat in 1963. Rainfall was deficient in July in Amphur Muang and Kamalasai in 1954 and in Yang Talat in 1964. Kalasin was not badly affected by the serious drought of 1967, nor that of 1972

problems are equally likely to arise. Finally, it may be noted that in some years, more than adequate, indeed excessive, rainfall may be experienced. In 1955, for example, Yang Talat recorded 830 mm. in the two months of May and June and in 1966, both Amphur Muang and Kamalasai had falls exceeding 750 mm. Such downpours can be as damaging as rain failing.

As has been suggested earlier, moreover, the effectiveness of the rainfall is very much dependent on the general soil quality of the locality. According to their ability to hold water, the various soil types present in the area are ready for cultivation at differing dates. The relatively low-lying and clayey soils of the low terrace, mainly composed of the Roi-et soil series, are usually planted rather quickly. The higher and more sandy areas of the upper terrace, where suitable for paddy at all, take a longer period to fill up with water and are planted rather later. According to Vira, this may be as much as 14 days to one month after the lower parts and

> "in the clayey soils of the alluvial valleys, the situation is often reversed. Here floods take place during the peak of the rainy season, and rice planting in several cases is postponed till after the period of floods." 17

Methods of Investigation

The study of the theoretical problems outlined in Chapters I and II in the context of the Lam Pao Irrigation Project area of Northeast Thailand was undertaken in connection with the School of Oriental and African Studies research project into

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17. Vira et al., op.cit., p.6.

land use changes in irrigated agriculture.√ Investigation into such problems required the collection of data and detailed information at the farm level such as was not otherwise available in Thailand. Even the benchmark studies carried out by the Mekong Committee in the region produced only summary information.[18] The context of the S.O.A.S. survey, backed as it was by the Mekong Committee and the Royal Thai Government, gave access to material and information otherwise unavailable over a sufficient period of time to make the study worthwhile.

Although this and subsequent chapters draw heavily on information collected by the S.O.A.S. survey, this was not the only line of investigation. At various times interviews and discussions were held with individual villagers, village leaders, government officials and traders in Kalasin and surrounding areas; some supplementary questionnaire surveys were made among smaller groups of farmers; additional material was collected from provincial and district administrative offices, as well as from various central government departments in Bangkok. In the context of the main S.O.A.S. questionnaire too, sections were expanded after the first year of investigations in order to incorporate particular lines of enquiry suggested by informal questions in the field. These various methods of study are discussed at greater length below.

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18. See bibliography, Mekong Committee, Chamlong Tohtong.

(a) The Area of Investigation

In order to obtain the detailed information required and in order that comparability over a period of five years might be retained, it was decided that intensive studies of a small number of villages within the Lam Pao project area should be made in such a way as to provide a basis for estimating statistically the situation over the entire irrigation area. This approach would not only enable a more detailed study of the internal relationships of what are, after the farm household, the essential economic units of the area, but would be more likely to gain the confidence of the inhabitants of the selected villages than would a more cursory contact.

On this basis, after a preliminary reconnaissance of a large number of villages in the whole of the irrigation project area, a total of seven villages were selected as being representative of the many others in the irrigation scheme. Many considerations were involved in the selection of the seven villages, whose location in relation to the irrigation system may be seen from Figures III-2 and III-4. The villages were distributed between the three administrative districts included in the project, three in Yang Talat, two in Amphur Muang and two in Kamalasai. (Figure III-1). Their locations range from the higher land with its more accentuated relief near the Lam Pao dam site (Ban Na Chuak Nuea), through the extensive low terrace of the Lam Pao-Lam Chi drainage system (Ban Tum, Ban Lek) to the Lam Chi flood plain sites of Ban Non Sung and Ban Lao Yai. One village, Ban Fai Taek, is located on the levee of the Lam Pao; the other, Ban Um Mao, is located at the edge of the narrow flood plain of the Lam Phan

river. The villages also vary in age and size. Ban Na Chuak Nuea is still in the process of developing land from the forest which surrounds it and is no more than 30-40 years old, whereas the terrace villages have long held their paddy lands so that the largest, Ban Tum and Ban Lek, are both located in this area. Ban Tum had reached a total of some 220 households by 1972-73, whereas the Lam Chi flood plain village of Ban Lao Yai numbered only 45 households.

A further consideration was that of accessibility, partly from the point of view of ease of study, but mainly with regard to proximity to the main market centre at Kalasin. Two villages, Ban Fai Taek and Ban Lek, are within easy walking distance of the town, whereas Ban Na Chuak Nuea lies some 35 kilometres distant near the dam site and Ban Lao Yai is as far away in terms of length of journey down poor earth and laterite roads in the opposite direction. Once again, allowance was made for the date at which the villages were due to receive the irrigation water, with Ban Na Chuak Nuea the first to receive and with Ban Lao Yai originally scheduled to wait until 1975.[19] Ban Lek is the only village of the seven located within the left main canal system. Finally some consideration was given to other work already carried out or proposed in the area; in 1971 a team from Chulalongkorn University, Bangkok had been working in Ban Na Chuak Nuea;[20] an investigation into educational development in Ban Tum and Ban Non Sung was planned by the

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19. With the rescheduling of the project, Ban Lao Yai can only expect irrigation and drainage facilities in 1980.

20. Two students from the Social Science Research Institute carrying out a detailed investigation into labour use in that village and the neighbouring upland village of Ban Nong Kao.

Mekong Committee; an investment by the I.B.R.D. in the right bank stage 1 area, encompassing Ban Na Chuak Nuea, Ban Tum, Ban Um Mao and Ban Fai Taek, was also mooted.[21] Table III-2 presents summarised characteristics for the seven villages under study.

Although the greater part of the study was concentrated on the villages mentioned above, these were not the only places investigated.[22] Visits were paid to a number of other neighbouring villages and discussions held with headmen and other villagers. Outside the immediate confines of the irrigation system, the problems of upland, non-irrigible areas were examined and visits were paid also to the villages within the F.A.O.-U.N.D.P. Experimental and Demonstration Farm at Huay Sithon near Kalasin town. (Figure III-1).

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21. This proposed investment eventually materialised in 1974 in the form of a major programme for the rehabilitation of the three major irrigation projects in the Northeast region, namely, Lam Pao, Nam Phong and Lam Phra Phlerng.

22. By 1973 it was apparent that the schedule of irrigation development originally envisaged by the Royal Irrigation Department had been held up by major budgetry problems. Maintenance work on the right bank stage 1 system had become necessary and extension to stage 2 was re-scheduled for 1977-80.
For this reason, work on the southerly villages in the S.O.A.S. Lam Pao study was reduced and a re-orientation towards three new villages, previously only under observation, was made in 1975. These villages, all within the right bank stage 1 irrigation area, were: Ban Chiang Ngam, close to Ban Tum and receiving water from canals 1L and 1Li, Ban Kham Maet, a more pioneer village receiving water from the right main canal at kilometre 26 and Ban Dong Muang, on canal 1L-1R, close to Ban Fai Taek. All were receiving relatively good supplies of irrigation water. See Figures III-2 and III-4.

TABLE III - 2

Lam Pao Survey: Sample Villages

Summary Characteristics

	TAMBOL	DISTRICT	NO. HOUSEHOLDS (1971)	LOCATION	DISTANCE FROM KALASIN (Kilometres)	CANAL LOCATION
BAN NA CHUAK NUEA	WER	YANG TALAT	124	UPLAND	33	RIGHT MAIN KM 2
BAN TUM	BUA BAAN	YANG TALAT	201	LOW TERRACE	23	RIGHT MAIN 16 + 1L1
BAN UM MAO	UM MAO	YANG TALAT	104	LAM PHAN FLOODPLAIN	9	RIGHT MAIN 2L KM 11
BAN FAI TAEK	LAM PHAN	MUANG	78	LAM PAO LEVEE	4	RIGHT MAIN 1L KM 7
BAN LEK	NUEA	MUANG	140	LOW TERRACE	3	LEFT MAIN 4R-1L KM1
BAN NON SUNG	NONG PAEN	KAMALASAI	124	LAM CHI FLOODPLAIN	31	RIGHT MAIN 1R - KM4
BAN LAO YAI	KUT KHONG CHAI	KAMALASAI	39	LAM CHI FLOODPLAIN	37	RIGHT MAIN 1R - KM 8

(b) The Timing of the Investigation

The School of Oriental and African Studies research project has been planned to extend over the period of five years from 1971 to 1976. The present study deals mainly with work done in the period from March 1971 to May 1973, although data are drawn almost exclusively from the first two years of operations during the dry seasons of 1970-71 and 1971-72.

It was felt essential that field-work should be concentrated in the dry season for a number of reasons. In the first place, at other times of the year, access to many villages was felt to be rather difficult. Secondly, and probably of greater importance, it was realised that during the rainy season farmers in the area would be heavily committed working in the fields and would therefore not be available for interview and discussion. Indeed even the actual time chosen for the field-work was found to be rather late; in both the first two years of investigations farmers began to prepare their upland during the interview period in March and April.[23] A further consideration of timing centred on the accuracy of the information to be gathered; since the questionnaires were based on recall by the farmer, it was essential that he should be in no doubt about the actual period about which he was being asked. It was therefore advantageous to conduct the survey at a time as near as possible to the end of the agricultural year in question, before a new main crop was under

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23. The importance of this timing was highlighted in a later enumeration season in 1975 when organisational difficulties led to the late commencement of enumeration in May. Rains were also early and paddy preparation had begun. It was almost impossible to meet farmers during the day and most enumeration was carried out at night.

way.[24]

Taking these points into consideration, this study has been mainly concentrated in three field-work periods:-

(a) March-June 1971

(b) March-June 1972

(c) March-May 1973

In addition, however, it was recognised that any record of the actual cropping pattern on the ground during the main crop season could not be made at the time of the year suitable for questionnaire investigation. For this reason a further period of field-work was carried out in September and early October 1972.

Here the question might be raised of whether these years were representative of the prevailing conditions in the North-east region over the last few years, particularly as regards climate. Climatic data were unfortunately not available for the years of survey, but observation suggested that 1970-71 and 1971-72 were generally good seasons in the area. 1970-71 was a year of very favourable rains except in the lower-lying areas where flooding was a problem; in 1971-72 the rains were lighter and later, so that some of the upland suffered from a degree of drought; in 1972-73, the Northeast was badly hit by drought conditions, but Kalasin did not appear to have been particularly badly affected and no real problems were experienced. Economically the period was rather atypical of the preceding decade in terms of rice prices, but this may be said to reflect fundamental changes in the international market.

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24. Although with the growth of second cropping some problem of distinguishing the second crop season was encountered.

(c) The Methods of Investigation

It was noted above that the study of conditions existing in the Lam Pao irrigation area followed a number of different lines of enquiry. These may be summed up under five headings:-

(1) The Main Lam Pao Research Project Questionnaire

(2) Supplementary Questionnaires

(3) Land Tenure Survey

(4) Land Use Survey

(5) Other Investigations

Although these foci of study are in no way distinct and complement one another in the overall examination, the purpose, methods and problems involved with each will be considered separately.

The Main Lam Pao Research Project Questionnaire. (Appendix 2)

This questionnaire was designed with the overall purpose of recording the socio-economic conditions of the farm families of the Lam Pao irrigation area over a period of five years as they received irrigation water. The questionnaire seeks details on all aspects of the family economy, but lays particular stress on land use and labour utilisation. It is designed to allow for developments in second cropping under irrigation. Although the questionnaire does not retain its original format from the first year of enumeration, it has been expanded rather than changed and still retains the original structure necessary for comparability between the individual years of study.

The questionnaire has been structured to cover basically nine items:

(i) Demographic Profile, including details of age, sex, marital status, level of education for all persons in the family, including temporary absentees.

(ii) Agricultural Economy, giving details of area planted, production and disposal of all crops grown.

(iii) Land Use, giving by-plot details of area planted, crop damage, production and inputs, including labour from all sources, use of fertiliser etc.

(iv) Other Income Sources, with details of numbers of livestock held, bought and sold, plus income from fishing, handicraft manufacture, off-farm income and remittances.

(v) Standard of Living, considering the consumer goods owned by individual households and the extent of their external contacts.

(vi) Membership of farmers' associations and money borrowed from them.

(vii) Credit Situation, with details of bank accounts, borrowing from banks and from non-institutional credit sources.

(viii) Aspirations of farmers to improve their agriculture and/or their standard of living.

(ix) Knowledge and use of selected agricultural innovations, contact with experimental stations and satisfaction with prices, interest rates and transport costs.

The data collected above relied mainly on farmers' ability to recall the activities of the previous twelve months and as such was clearly open to a certain degree of error. On the other hand, in that the activities enquired into, particularly in terms of use of land, were the most important parts of a subsistence farmer's life, he was often able to give details in very exact terms. Nevertheless problems did arise in certain parts of the questionnaire which were difficult to overcome. These can be said to have arisen in three main areas, from sheer vagueness about individual details, from difficulties in interpretation of measures and concepts difficult to put across in the Thai language and from unwillingness to give information.

In many ways the first group of problems were the most serious, since they tended to affect the basic details on land use and income. Farmers were often unsure of the exact size of their holding unless they had recently been visited by officials of the Land Department in the course of their work in defining holdings and issuing title deeds.[25] Again, where farmers had not sold any of their rice in the course of the year, there was a certain vagueness in their notion of the level of production in the previous year. Most farmers bring their rice from the threshing floor in large baskets known as 'kwian', from the fact that they are designed to fit the platform of a bullock-cart, also called a 'kwian'. These kwian baskets are reputed to hold one metric ton of paddy, but they clearly vary considerably in size. Below this measure, baskets ('takhraa'), usually carried as a pair on a pole across the shoulder, are used and these too vary in size. Commonly a pair of baskets (one 'haap') take 30 kilogrammes of paddy, but smaller baskets of 10 kilogrammes per basket also exist. In most cases the farmers are able to give fairly accurate representations of their production in these terms and even more so of the amount sold, but in view of the measurement difficulties some degree of error could not be excluded. There is, however, no reason to suppose that over-estimation was more common than under-estimation.

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25. The Land Department have recently been more active and farmer knowledge has become more certain. In the past, moreover, farmers were accustomed to underestimate their holding in talking to officials in order to avoid paying too much land tax. While some farmers may have continued this practice within the present study, the fact that the survey was by non-Thai personnel and the constant presence of the village headmen at all interviews gave villagers little reason to withhold what they thought to be the truth.

An equally serious problem in this respect and rather more difficult to solve was that of labour utilisation. Without a close observation of sample families actually at work, a technique precluded for administrative reasons, farmers' estimates of how long a particular process had taken were often initially very imprecise, with answers like 'one month' or 'half-a-month' common. Clearly as labour use was one of the most important inputs, such vague answers were unwelcome and enumerators were asked to seek greater precision. It was found, for example, that interviewees were able to give quite exact estimates of the length of time it had taken the available work force to cultivate one rai. In answering these questions the farmers would often indicate quite freely that they had had problems such as hard soil or an old buffalo and from this more exact figures of labour utilisation could be derived. Where hired labour was concerned the fact that the farmer had to pay out cash made the problem more easily soluble.

The second problem of interpretation of measures and of translation of English concepts into Thai language has already been touched upon in discussing estimates of production. Farmers could sometimes, although rarely, only calculate their kenaf production in terms of bundles ('mats') which they had sold. In general these bundles were said to weigh approximately one picul (60 kilogrammes), but obviously here again the estimate at the village level could be vague unless the farmer had actually seen the merchant weighing the bundles. For fertiliser too difficulties were quite common, both for chemical fertiliser and, more particularly, for animal manure. Farmers were aware how many bags of fertiliser they had purchased; they could rarely say what weight of fertiliser was in each bag. This was

an insurmountable difficulty in the second year of enumeration especially, for, whereas at first bags were standardised at 50 kilogrammes, by then both 50 kilogramme bags and 40 kilogramme sacks were on the market. Manure was even more tricky. Again the 'kwian' was used, this time the equivalent of the English 'a cartload' and obviously impossible to estimate. More exact was the measure known as the 'piip', the equivalent of a 20 litre petrol can. Although farmers could say how many 'piip' they applied, the quantity depended on the state of the manure. Peanuts were also commonly weighed by the same measure.[26]

Apart from such problems of measures, interpretation difficulties did also arise. The most important of these concerned the disposal of rice. Farmers tended to take the enquiry concerning the amount of rice they had sold as referring only to the new rice crop. As a result there was probably some under-enumeration of the amount sold in the first year of the survey, especially in the immediate pre-harvest period.

Another difficulty arose over what were regarded as innovations. Although the novelty of chemical fertilisers, insecticides and tractors were clear enough, the farmers' ideas of new varieties of rice and new upland crops were rather different from what had been anticipated. Indeed farmers themselves differed in their interpretation; to some, the semi-improved varieties like 'niaw sanpatong' or 'kamphaitaichung' were new, whereas others had been using them for a number of years and did not regard them as such. The difficulty

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26. Some effort was made to derive a standard weight for the various measures used to assess crop production and fertiliser input. These are given in the glossary of Thai terms.

was finally overcome by actually asking if the semi-improved varities were being used by name.

The third group of problems turned out not to be the major difficulty that might have been supposed. The fact that it was known by farmers through the village headmen that the survey was only indirectly government-sponsored, that the survey was going on for some years and that the village headmen supported and were assisting the work, seemed to set most farmers' minds at rest about the work. Although enumerators were requested to show tact when asking delicate questions like those on credit, debt and banking and were instructed not to press too hard for answers to such questions, very few farmers seemed unwilling to divulge information. Moneylenders and traders were quite willing to discuss the financial aspects of their businesses and only one farmer in two years of interviews would not reveal the amount of his bank deposit.

Within the seven villages chosen, it was decided that the time available to the enumeration team from the Royal Irrigation Department precluded a total coverage of all households. With this constraint in mind, a 30% sample of households in each village was finally settled upon. It was argued that, in future years, the project would require a number of farmers of whom case studies could be made. Assuming a total population in the selected villages of 800-900 households, then a random 30% sample with replacement each year would give, under the Multiplication Rule of Probability from 22-24 farm families which would be interviewed in each of the first three years. These families could then be taken as case studies for the further duration of the survey.

Aiming at a 30% sample therefore the number of families enumerated in the first two years of survey were as presented in Table III-3. In each year the sample was drawn entirely randomly from the list of village households kept by the village headman, although these lists were at first a little unreliable and had to be updated before a second year's enumeration. As a consequence the 30% sample was not absolutely maintained overall in the first year of enumeration.

In the actual administration of the questionnaire further problems were encountered. In basing the questionnaire entirely on farmer recall, it was necessary to obtain where possible the assistance of the head of the household. On the other hand, it was clearly impractical to visit the villages time after time to find household heads who had been absent on the previous occasion. For this reason, the questionnaire was sometimes administered to wives or sons-in-law, with a resultant loss of accuracy and consistency. In those cases in which the family was being interviewed in a second or third successive year, however, it was more necessary to achieve comparability and every effort was made to ask the interviewee of the previous years. Where possible during each period of interview the village headman was present whether or not he himself was involved in interrogation. In this way if a farmer were in any doubt about the meaning of a question or indeed of some detail of his own farming practice, he was able to ask the headman for clarification. In general, moreover, interviews were held altogether in the headman's house, the temple or the village meeting hall and many villagers not actually being questioned were present. These would often be consulted by their friends or would correct an

TABLE III - 3

Lam Pao Survey Villages Enumeration Samples, 1971-73

VILLAGE	No. Households 1971	No. Samples 1971	% Total	No. Samples 1972	% Total	No. Households 1973 **	No. Samples	% Total
BAN NA CHUAK NUEA	124	35	28.2	37	29.8	123	38	30.9
BAN TUM	201	57	28.4	60	29.9	233	73	31.3
BAN UM MAO	104	35	33.7	32	30.8	104	34	32.7
BAN FAI TAEK	78	25	32.1	23	29.5	97	30	30.9
BAN LEK	140	42	30.0	42	30.0	156	49	31.4
BAN NON SUNG	124	33	26.6	37	29.8	135	42	31.1
BAN LAO YAI	39	11	28.2	12	30.8	56	18	32.1
TOTAL SAMPLE	810	238	29.4	243	30.0	904	284	31.4

** Villages lists revised

interviewee if they considered that his answer was wrong. At times arguments would ensue, but the information offered afterwards was all the more convincing as a result.

Other Questionnaire Schedules

Besides the main Lam Pao research project questionnaire, it was sometimes considered necessary to ask other questions in a formal manner. In this present study, use has been made of two such schedules, one in conjunction with the main Lam Pao sample. The first, run independently of the main survey, sought to establish the general opinion of farmers concerning farmers' associations. The questions asked were to some extent a duplication of some asked in the main questionnaire, but more details were sought on the mechanisms of marketing and supply, of labour utilisation and of attitude towards farmers' associations. This questionnaire schedule is presented as Appendix 3.

The small number of questionnaires administered under this schedule is partly explained by the incorporation of most of the questions into the main questionnaire for the 1972 season. Hereafter, the only extra information sought was that concerning the supply of fertiliser. This was investigated in 1973 by means of a small number of questions appended to the main questionnaire. These asked the farmer to supply in more detail the amount of chemical fertiliser purchased, the price per sack, the source and the method of payment. If they were able, farmers buying on credit were asked to give the equivalent cash terms.

The Land Tenure Survey

A major deficiency in knowledge about the subsistence agricultural economy of Northeast Thailand concerns the land tenure situation. It has often been noted that the north-eastern farmer is mainly an owner-cultivator, the average size of holding has been established in the agricultural census and anthropologists have pointed out that the inheritance system is essentially matrilineal. No work has however been done on the spatial aspects of the land-holding pattern, partly because land in the area has never been in short supply and partly because few farmers in the region own proper land title deeds. Under conditions of irrigated agriculture the clear delimitation of holdings becomes an important consideration, both for the organisation of water distribution and in case of future re-distribution of land. For these reasons such a survey was an integral part of the Lam Pao research project investigations.

The land tenure survey was carried out by means of aerial photographs acquired from the Map Department of the Royal Thai Army and flown by the United States Bureau of Reclamation in connection with surveys made for the Pa Mong project. The photographs available unfortunately extended eastwards only as far as Kalasin town, which meant that only six of the seven selected villages were covered, the exception being Ban Lek. In addition it was found that one photograph, covering part of the upland of Ban Tum was also unavailable. Since the area involved was only small, this latter area could be filled in by a rapid plane-table survey, but the large holding area of Ban Lek with its widely scattered plots was an impractical proposition.

In the first place small 9" by 9" prints at a scale of 1 : 7000 were obtained and constructed into mosaics covering six of the villages. These mosaics were taken to the villages in order to familiarise the Puyaiban[27] and others with their use; results were so favourable that later visits were made with enlarged 18" by 18" dyeline prints at a scale of approximately 1 : 3500.

The technique of investigation was to invite the headman and other villagers to identify their own plots from the aerial photograph. On most occasions the headmen bore the brunt of the enquiry and indeed great strain was imposed upon these men. It was important therefore to recognise early signs of tiredness such as repetition of plots or self-contradiction on the part of the headman. The technique followed, despite earlier visits, always began with a period in which the farmers re-acquainted themselves with the photographs. Hereafter, the headman or other villagers were invited to point out their holdings, usually starting with that of the headman. At first, the farmers' notion of the extent of each plot was vague, but enquiry about the width (number of small internal fields) of the plot, about landmarks like streams, tracks or even prominent trees or clumps of bamboo, enabled more definite boundaries to be settled. Differences in tones and textures on the prints, which were flown in the dry season of 1968-69, could also suggest boundaries between neighbouring farmers' fields. Suggestions of likely boundaries were made to the headman and his companions and they would then confirm or amend the suggestion.

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27. The Thai word for 'headman', literally 'big man of the village'. This is a standard transliteration; more correct would be 'Phuu Yai Baan'.

Once finalised, the owner of the plot was identified on the village lists.

The initial work on these land tenure patterns was carried out during the 1971 field-work season, mainly in consultation with small groups of villagers. Hereafter the main work was one of revision and correction. This was done during the enumeration periods in 1972 and 1973 when individual villagers were invited to locate their own plots on the draft maps and relate them to those of their neighbours. In this way a certain number of amendments were made, but equally a number of significant changes in ownership and cases of subdivision of plots were found.

The Land Use Survey

Further corroboration of the Land Tenure maps was given by a partial Land Use survey, covering Ban Na Chuak Nuea and Ban Tum, carried out in September 1972. This time was chosen to give the most complete coverage and easiest identification of crops in the field, before the completion of the kenaf harvest and with the rice still in the fields. The crops were identified partly by field recognition, partly by consultation with the farmers as they worked in the fields. The prime problem was to distinguish between glutinous and non-glutinous rice, almost impossible in the early stages of growth. In general, however, farmers were able to tell which of their fellows had planted some non-glutinous rice and where this was located.

Other Fields of Enquiry

In the course of the successive years of field-work, other sources of background and comparative information have been pursued, sometimes at the village level, but more usually in other locations. In the present study a number of these sources will be used and it is useful to mention them briefly here.

In addition to the more formal lines of investigation described above, more informal discussions were also held with groups of farmers. In part these fulfilled the function of extension work in which farmers' problems were raised for comment and advice, in part they helped to confirm ideas and impressions which had been formed by members of the survey team. Although informal, these discussions were often structured so as to get information on a list of points without giving the impression of formality.[28] The discussion group usually included leaders of the village community, notably the headman, his deputies, the head teacher and farmers' association leaders, but many others also attended.

Outside the context of the villages of the Lam Pao irrigation area, information was sought from two main sources, general central and local government data on the Northeast region and the Kalasin area in particular, and comparative material from other irrigation projects in the region. The first of these proved to be the more difficult task. The difficulties of Thai statistics at the national and regional

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28. Some of the discussions were taped, but farmers seemed unconcerned by this.

level have been noted elsewhere.[29] At the local level these difficulties tend to be compounded. Kalasin, it is true, is a particularly difficult case, since up to 1947 the area was part of Mahasarakham province and up to 1957 all changwat statistical information was sent to that centre for initial processing. For more recent material, however, the problem is scarcely any easier. Changwat and district level offices, especially of small provinces like Kalasin, are subject to a high turnover of officers. After the departure of one, it is often some months before his replacement arrives and by this time some of the office's less important duties will have been allowed to lapse. Even then the new appointee will spend some time familiarising himself with the tasks he has to do and may well carry them out on a different basis from his predecessor. This lack of continuity is often compounded further by the fact that he will be asked by his Bangkok ministry to collect different information from that previously acquired as a result of a change in policy in the ministry. The net result of all this is that information available at the provincial and district offices is frequently discontinuous and unchecked, to say nothing of its accuracy.

In terms of accuracy, one might say ambiguously that this is as good as could be expected. Most of the agricultural information which arrives at the district offices is collected at the village level by the headman and transmitted by him to the 'kamnan' or commune head. The headman's duties include

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29. Notably by Behrman,J.R., "Supply Response in Underdeveloped Agriculture: A Case Study of Four Major Arrival Crops in Thailand 1937-1963", Amsterdam 1967, pp.201-217. and Ingram, James C., "Economic Change in Thailand 1850-1970", Stanford 1971, pp.240-243.

an annual census of livestock in the village as well as a yearly survey of the planted area, harvested area and the production of all major crops grown in the village. Obviously the accuracy of all this depends on the diligence and energy of the local village leaders, some of whom seem unlikely to be absolutely efficient. One example, outside the field of agriculture, serves to support this suggestion.

In early 1973 the new headman of Ban Tum was elected 'kamnan'. This gave him the duty of registration of births and deaths for the commune as a whole. In connection with this he received the family registration cards for all the families in the commune, which he allowed the writer to check against the existing survey village list for Ban Tum. One name missing from the latter perplexed the 'kamnan', for it described one head of household as 'dek chaay',[30] the title usually given to a small boy. It emerged that the said person was at least thirty, had never been a household head and had left the village some years before!

The second line of investigation outside the area chosen for intensive study was an examination of conditions in other irrigation projects in the Northeast region. To this end three other projects were visited. The smallest and closest was the F.A.O. - U.N.D.P. Experimental and Demonstration Farm in Kalasin, eventually to be linked up with the Lam Pao scheme.[31] This highly capitalised project covers only 2000 rai and about 130 farmers, but it has been experimenting with a whole variety of techniques for irrigated

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30. The translation is simply 'boy child'.

31. The project manager of Lam Pao and of Huay Sithon are now the same man.

agriculture and a wide range of crops which might be suitable for dry season irrigated cropping. After initial slow progress, by dry season 1972-73, the farm had achieved a second cropped area of 320 rai.[32] A second centre for brief investigation was the large project based on the Nam Phong diversion dam in Khonkaen province.[33] Here, although problems have been met in the maintenance of the system and in getting water to the farmers, certain restricted areas, following extension work by the Asian Development Bank, were participating in second cropping. The main centre for second cropping in Northeast Thailand by 1972-73, however, was the smaller project of Lam Phra Phlerng in Nakorn Ratchasima province. Here irrigation water has been supplied for some five years in the wet season and for two-three years in the dry season. The system is being well used, despite some problems of capacity, and dry season cropping had reached nearly 7000 rai in 1973. This project has reached a more advanced stage than Lam Pao and extensive comparative reference will be made to it,[34] and to the other two projects in this study.

(d) Data Handling and Processing

The size of the data body collected during the above

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32. Personal Communication, Dr. Rudolf Luenburger, Manager, Kalasin Farm. For further details on the project see Ng, R.C.Y. "The Socio-Economic Conditions in Huay Sithon", Report for F.A.O. London 1972, mimeograph, and "Socio-Economic Changes Under the Impact of Irrigation in the Huay Sithon Project Area". Report for F.A.O. December 1974, mimeograph.

33. The project is usually known as the Nongwai project.

34. Ng, R.C.Y., H.Demaine and C.J.Dixon "A Report on the Introduction of Dry Season Cropping in the Lam Phra Phlerng Irrigation Project Area", Field Report for I.B.R.D., London 1973, mimeo.

investigations made the use of computer processing absolutely necessary for the full understanding of the mass of information. For this reason the data collected, once checked, was put onto data coding sheets and punched on data cards. Processing was then largely carried out at the I.B.M. 360/370 installation at University College, University of London.

In order to facilitate the rapid sorting and processing of these data, a series of programmes of small core requirement were developed and tested and these were then assembled as a library package on the UCMODLIB disk. In the present study extensive use has been made of this package.[35] For a number of purposes these programmes did not fit the needs of analysis, however, and other purposive routines were developed to this end. In addition use has been made of the widely known 'Symap' programme for computer mapping;[36] examples of both the choropleth and the isopleth options of this programme will be found in the course of the text.

General Socio-Economic Conditions of the Study Area

The methods of study outlined above revealed socio-economic conditions in the Lam Pao Irrigation Project area similar to those which have been discovered in other locations in the Northeast region. These will be discussed below mainly in the context of data taken from the first year of survey in 1971,

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35. Ng, R.C.Y. and Demaine,H., "The S.O.A.S. Lam Pao Programme Series for Survey Data Processing", Department of Geography, School of Oriental and African Studies, London 1973, mimeo.

36. Laboratory for Computer Graphics and Spatial Analysis, Harvard Center for Environmental Design Studies, "Symap Version 5-17" Cambridge, Massachusetts.

which may be taken as a benchmark from which to assess any subsequent changes. In 1971, only a small area of the project was receiving any irrigation water,[37] so that conditions were felt to be essentially little different from the pre-irrigation situation. The discussion which follows will be mainly summary and several points only touched upon will be discussed at greater length in subsequent chapters.

As in most other lowland areas of Northeast Thailand, the basic economic unit in the Lam Pao river basin is the nuclear or extended family. In some ways it is difficult to distinguish between these two forms of organisation, in that the typical Thai farm family may at one time contain one or more married children and their spouses who may or may not help to work the land of the household head. On the other hand, it may be that such married children, while maintaining a separate home, have no land of their own and help in cultivation of the original family plot while being partially independent of it. Sometimes such households have built their own house in the same compound as their parents.[38]

Clearly the definition of household is rather complicated, but the S.O.A.S. Lam Pao survey recognises as a household a family unit which maintains a separate, economically independent identity, whether the family be nuclear or extended. The survey recorded that in 1971 such households averaged 6.9 persons per family, a figure similar to the 6.86 recorded by Chamlong in the

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37. This in fact included Ban Na Chuak Nuea.

38. See Mizune, Keichi, "Multihousehold Compounds in Northeast Thailand", Asian Survey, vol. VIII (10), 1968, pp.842-52.

Nongwai irrigation area in 1969.[39] Both these figures do seem rather higher than for the Northeast region as a whole. The 1970 Census, for example, noted an average household size for the region of 6.25 persons,[40] but this figure included the rather smaller households of the urban areas and the size of agricultural households is probably rather bigger. This is confirmed by the volume of the census specific to Kalasin.[41] This shows that, whereas the average size of household in the Kalasin 'thesabaan'[42] was only 5.4 persons and in the 'sukapibaan'[43] of Yang Talat, Kamalasai and Kuchinarai only 6.1 persons, the average size of rural household was 6.3. The higher figures for Lam Pao and Nongwai suggest a higher density of population in the principal alluvial valleys than in the surrounding upland areas over the Northeast as a whole.

The farm families in the Lam Pao irrigation area in 1970-71 had an average total income of 5934 baht, which compares rather poorly with the level of over 10,000 baht recorded in Nongwai for crop season 1968-69[44] and the 8767 baht noted by the Mekong Committee at Huay Sithon in 1969-70.[45] In the

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39. Chamlong Tohtong, "Report on Benchmark Socio-Economic Survey of Nong Wai Irrigated Area (Right Main Canal) as of 1968", Mekong Committee, Bangkok, 1969, p.4.

40. National Statistical Office, "Thailand Statistical Year Book, No.29, 1970-71", Bangkok 1971, Table 12, pp.37-9.

41. National Statistical Office, "1970 Population and Housing Census : Changwat Kalasin", Table 2, p.2, Bangkok 1973.

42. 'thesabaan' = municipality.

43. 'sukapibaan' = sanitary district.

44. Chamlong, op.cit., p.13. Rice value was calculated at 1.0 baht/kilogramme. p.10.

45. Mekong Committee, "Report on a Socio-Economic Survey of Farmers in Huay Sithon (Kalasin) 1969-70", Mekong-NEDB, Bangkok 1970, p.22. Rice value was calculated at 0.59-0.60 baht/kg.

latter area, it is true, some 800 baht was derived from second cropping which was scarcely noted in the Lam Pao survey in 1970, but the figure recorded still appears rather low, especially as the method of calculation of income followed basically the same form as that for the other surveys with the gross value of crop production being included.

On the other hand, it should be noted that in the crop season of 1970-71 covered by the initial year's survey at Lam Pao, the price of both major crops cultivated was low, that for paddy particularly so. In fact for purposes of calculation of the value of the rice crop where no rice was sold, the average recorded price of 0.51 baht per kilogramme was used. As crops provide 60% of the total income and paddy provides 65% of the total value of crops, then it would appear that the overall level of income was depressed by some 2243 baht by the low price of rice compared with the previous year's level of 1.0 baht per kilogramme. A rice price similar to those in the previous years would have given the Lam Pao sample households a total income level of 8177 baht, comparable to that at Huay Sithon and not substantially below the rather more commercialised area of Nongwai. Moreover, if the original figure of 860 baht is well below the Northeast region average <u>per capita</u> income,[46] the amended figure of 1185 baht is much more in line, especially if allowance is made for the urban component in the regional figures. Indeed in the 1971-72 crop season, the slightly higher price of rice may be said to be partly reflected in the rather higher figure of total income, which was marginally higher at 6328 baht per family or 917 baht per head, although this increase

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46. See above, Chapter II, Table II-2.

TABLE III - 4

Total Family Income: % Distribution by Village

1970-71

VILLAGE	INCOME (BAHT)						
	0-1000	1000-2500	2500-5000	5000-7500	7500-10000	10000-15000	15000 +
	% Total Cases						
BAN NA CHUAK NUEA	2.9	20.0	28.6	11.4	8.7	22.9	5.8
BAN TUM	3.6	24.6	29.6	17.5	13.8	5.4	5.4
BAN UM MAO	2.9	11.4	37.1	17.1	14.2	11.6	5.8
BAN FAI TAEK	-	4.0	44.0	16.0	12.0	20.0	4.0
BAN LEK	14.1	26.2	23.8	14.3	9.4	7.1	4.8
BAN NON SUNG	-	18.2	48.5	9.1	9.1	12.1	3.0
BAN LAO YAI	18.2	27.3	45.5	-	9.1	-	-
TOTAL SAMPLE	5.1	19.3	34.5	13.9	11.4	11.4	4.5

is easily within the limit of any possible sampling error.

Although average income levels in the Lam Pao sample correspond in general to figures suggested elsewhere in the Northeast region, it is clear that the sample contains many families who are much poorer than this and a few whose total income is very large indeed. Many families do not have a source of cash income and for others total income may be represented by the value of their subsistence paddy crop. In the 1970-71 sample, 2.9% of farm families received no cash income, while 5.1% had a total income of less than 1000 baht. At the other extreme, 8.3% of families had a total income of more than 12500 baht and 5.5% a cash income above that level. (Tables III-4 and III-5).

As will be shown below the income obtained by the farm families in the study area can be derived from a number of different sources. For this reason it is difficult to correlate differences in income with many other factors. Certainly there is little relationship between average income and average size of family, but a fairly significant relationship does exist between income size and size of holding with the bigger farms generally being the richer. However, a comparison of figures of successive crop seasons does suggest that the income received annually by individual households fluctuates considerably according to the environmental conditions, the selling price of the main crops and the relative availability of off-farm labouring opportunities in any single year.

Within the study area farm families generally receive income from six main sources, crops, livestock, fishing, handicraft manufactures, remittances from absent family members and off-

TABLE III - 5

Cash Family Income: % Distribution by Village

1970-71

VILLAGE	INCOME (BAHT)							
	0	0-500	500-1000	1000-2500	2500-5000	5000-7500	7500-10000	10000+
	% Total Cases							
BAN NA CHUAK NUEA	5.7	17.1	2.9	17.1	20.0	8.6	20.0	8.6
BAN TUM	3.5	5.3	8.8	33.3	19.3	17.5	5.3	7.1
BAN UM MAO	2.9	8.6	5.7	34.3	17.1	8.6	14.2	8.6
BAN FAI TAEK	-	-	4.0	20.0	40.0	12.0	16.0	8.0
BAN LEK	4.8	26.2	4.8	21.4	19.0	9.5	2.4	11.9
BAN NON SUNG	-	12.1	12.1	39.4	18.2	-	12.1	6.2
BAN LAO YAI	-	9.1	27.3	45.5	9.1	9.1	-	-
TOTAL SAMPLE	2.9	11.8	7.6	29.0	20.6	10.1	10.1	8.0

farm sources, usually labouring.[47] Of these, only four make any major contribution to earnings and two of these, crop production and off-farm employment are of the greatest importance in regulating the income level of individual families and at a more general level whole village communities. In the sample survey as a whole, income from crops was the most important single source of earnings. In 1970-71 this supplied 44.9% of the total income and this in a year of low prices. Only in two villages, Ban Na Chuak Nuea and Ban Fai Taek was crop production not the major income source and for Ban Tum and Ban Lao Yai it exceeded 50% of the total. In 1971-72 season when crop prices were somewhat improved, the overall contribution of crops to total income rose to 53.3% and in only one village, Ban Fai Taek, were they not the single most important income source. Only here and in Ban Um Mao was the contribution below 50%. (Tables III-6 and III-6a). If individual families are examined moreover, it may be noted that many were heavily dependent on crop income. For some 28.6% this was the sole source of income in 1970-71 and for 59.6% it formed over half of the total. (Table III-7).

Holding such a dominant position in the distribution of income sources, it may be expected that fluctuation in crop production level and in prices of the main crops grown in the area would have significant effects on income levels. If the income levels for the crop season of 1970-71 for the individual villages of the Lam Pao sample survey are compared with those of the following year, it is clear that this is so. The

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47. See below, Chapter V, for a breakdown of sources of off-farm income.

TABLE III - 6

Total Income by Source

Lam Pao Survey Villages 1970-71

VILLAGE	Total Income (Baht) (Mean House-hold)	% Crop Income (a)	% Livestock Income (b)	% Off-Farm Income (c)	% Remittance Income (d)	(c) + (d)
BAN NA CHUAK NUEA	6776	38.4	10.8	40.3	7.5	47.8
BAN TUM	5507	64.5	10.3	20.5	3.9	24.4
BAN UM MAO	6704	37.3	18.5	33.0	9.7	42.7
BAN FAI TAEK	7175	31.2	10.3	55.1	2.7	57.8
BAN LEK	5579	38.6	11.5	21.9	26.6	48.5
BAN NON SUNG	5356	48.7	23.2	20.1	5.6	25.7
BAN LAO YAI	3283	55.3	28.8	7.7	2.8	10.5
TOTAL SAMPLE	5934	44.9	14.0	30.2	9.3	39.5

TABLE III - 6a

Total Income by Source

Lam Pao Survey Villages 1971-72

VILLAGE	Total Income (Baht) (Mean House-Hold)	% Crop Income	% Livestock Income	% Off-Farm + Remittance Income
BAN NA CHUAK NUEA	6877	52.0	11.8	31.1
BAN TUM	6541	57.8	18.5	20.8
BAN UM MAO	8494	42.5	15.6	38.2
BAN FAI TAEK	5826	41.6	10.2	46.5
BAN LEK	4649	59.7	13.4	23.2
BAN NON SUNG	5754	58.8	23.2	11.7
BAN LAO YAI	6397	61.8	27.1	7.5
TOTAL SAMPLE	6328	53.3	16.6	26.2

greatest changes in average income are to be found in Ban Um Mao and Ban Lao Yai. In the latter case the total income has almost doubled, while in the former it increases by 25%. (Tables III-6 and III-6a). As was noted above, the first season with its fairly heavy rainfall produced some degree of flooding in these two low-lying villages and the resultant crop loss depressed income levels; in the season 1971-72, by contrast, the drier weather led to better yields and in Ban Lao Yai this also provided the feed for the expansion of poultry rearing. Although this is not reflected in terms of percentage contribution, because of the large increase in income from crops, it may be seen in an increase in total income from livestock in 1971-72. (Figure III-5).

Income from the sale of livestock and livestock products provides a fairly consistent 10-20% of the total income received by farm families in the Lam Pao sample survey. From 14.0% in 1970-71 there was a slight rise to 16.6% in the following year.[48] Livestock rarely makes the major contribution to farm income and only 8.4% of families got more than 50% of their income from this source in 1970-71. It can however be a useful supplementary standby if other sources fail. It seems likely that the high proportion of income from livestock recorded in Ban Lao Yai in 1970-71 was an indication of a sale of livestock assets (buffalo and cattle) in that poor year.[49] Most income

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48. In fact the price of large livestock in the Northeast region has been rising as a result of shortages elsewhere in the kingdom for buffaloes and the spread of Brahman breeding cattle. It is certain that, in 1974-75, the share of livestock in total income has been much greater.

49. A conclusion drawn from conversations with villagers, but see below, Chapter VI.

TABLE III - 7

% Income From Crops Household Distribution by Village

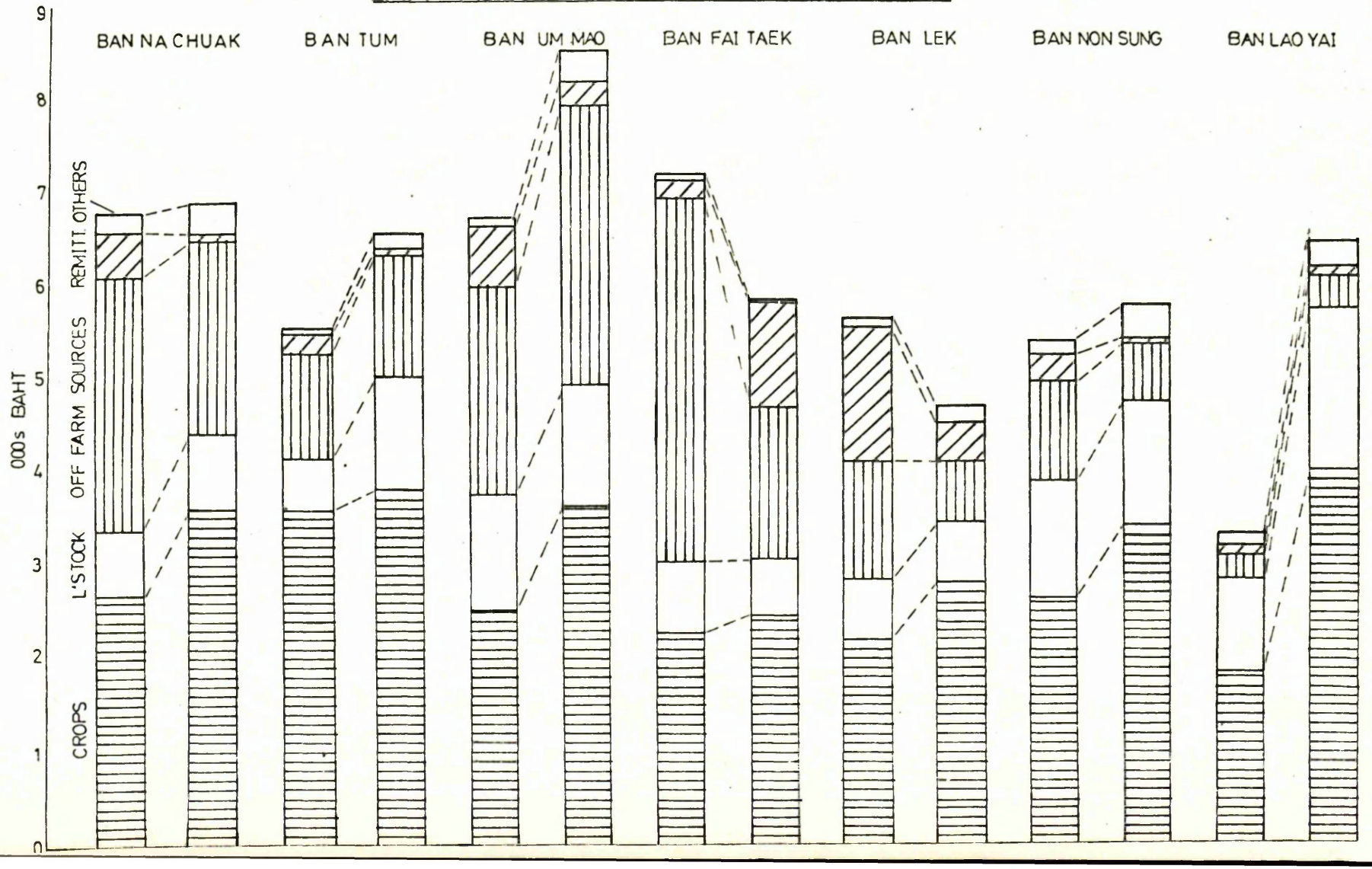
Lam Pao Survey Villages 1970-71

VILLAGE	0	0-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
						%				
						NO. CASES				
BAN NA CHUAK NUEA	-	4	6	4	2	4	2	3	6	4
BAN TUM	-	3	3	1	7	3	3	1	3	33
BAN UM MAO	-	6	4	5	2	3	3	3	1	8
BAN FAI TAEK	-	7	5	3	1	2	3	2	1	1
BAN LEK	2	6	5	2	1	2	7	2	-	15
BAN NON SUNG	-	3	3	2	6	4	3	4	3	5
BAN LAO YAI	-	-	2	-	1	2	1	1	2	2
TOTAL SAMPLE	2	29	28	17	20	20	22	16	16	68

FIGURE III-5

TOTAL INCOME : BREAKDOWN BY SOURCE

LAM PAO VILLAGES 1970-71 AND 1971-72



from livestock is derived from the sale of surplus draught animals, mainly buffaloes, but a number of specialist pig and poultry farmers are now to be found in the study area. Pigs are a significant enterprise in Ban Tum, where the village rice millers, above all the new 'kamnan', are important rearers; poultry is more significant in Ban Lao Yai as a result of extension work by local agricultural officers.[50]

Among the sources of income secondary to crops, livestock must take second place to earnings from off-farm sources. Among the households of the Lam Pao sample survey off-farm sources contributed some 30.1% of the total income in 1970-71, while remittances added a further 9.3%. In Ban Fai Taek and Ban Na Chuak Nuea, off-farm income was the single largest source of income, while in Ban Um Mao, off-farm sources including remittances were in total a larger source of earnings than crop production. At the individual farm level, 18.5% of farm households derived most of their income from this source, although only 45.8% of families actually had any such earnings at all. (Table III-8).

Just as crop income may be affected from year to year by price changes and by environmental hazards, so income from off-farm sources may not be a reliable addition to family income. Most of the employment in the area is available on government contract labouring and naturally construction projects are brought to an end. Thus in 1971-72, some of the villages which had been heavily dependent on off-farm labour show a decline in income levels, whereas the extension of canal construction work

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50. See below, Chapter VIII.

TABLE III - 8

% Income From Off-Farm Sources

Household Distribution By Village

Lam Pao Survey Villages 1970-71

VILLAGE	0	0 -10	10 -15	15 -20	20 -30	30 -40	40 -50	50 -75	75 -100
					%				
					NO. CASES				
BAN NA CHUAK NUEA	16	3	5	-	1	1	1	5	3
BAN TUM	44	1	2	-	1	1	1	2	5
BAN UM MAO	17	3	3	-	1	1	2	6	2
BAN FAI TAEK	5	1	0	1	1	2	5	5	5
BAN LEK	22	3	1	1	3	3	2	4	3
BAN NUN SUNG	16	1	5	4	2	-	1	3	1
BAN LAO YAI	9	-	-	-	1	-	1	-	-
TOTAL SAMPLE	129	12	16	6	10	8	13	25	19

in the neighbourhood of Ban Um Mao and the resurfacing of the nearby road favoured that village once again. The situation in Ban Fai Taek was particularly badly affected. The contribution of off-farm sources to total income in the village declined from 55.1% in 1970-71 to just 46.5% in 1971-72. The completion of canal construction work both in the Lam Pao project system and at nearby Huay Sithon was largely responsible for this decline, which, despite an increase in income from remittances in the village, was almost wholly responsible for the drop of average family income of over 1300 baht between the two years. A similar fall may be seen in Ban Lek, for essentially the same reason.[51] (Figure III-5).

Such fluctuations in off-farm employment opportunities clearly affect the income levels of farm families in the Lam Pao irrigation area in a very significant manner, but their importance is further highlighted if cash income alone is considered. In the sample survey in 1970-71, some 29.9% of the total income of the farm families was reckoned to be in non-cash form, either as fish caught and consumed in the family, handicraft products for home use or, dominantly, home-consumed agricultural produce, of which glutinous rice was the main component. A similar figure of 33.5% non-cash income was recorded in 1971-72. Table III-9 shows the village level variation in level of non-cash income for the two years of survey.

Removal of the non-cash element in agricultural production from the calculations means that, although crop production is the dominant source in gross income, in terms of cash income

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51. Although in Ban Lek, there was a substantial fall in average income from remittances, which was grossly inflated in 1970-71 by the inclusion in the sample of a family receiving 54,000 baht from this source.

TABLE III - 9

% Income in Cash

Lam Pao Survey Villages

1970-71 & 1971-72

VILLAGE	1970-71		1971-72	
	MEAN HOUSEHOLD CASH INCOME (BAHT)	% TOTAL INCOME	MEAN HOUSEHOLD CASH INCOME (BAHT)	% TOTAL INCOME
BAN NA CHUAK NUEA	4914	72.5	4498	65.4
BAN TUM	3900	70.8	4717	72.1
BAN UM MAO	4630	69.1	6206	73.1
BAN FAI TAEK	5334	74.3	3992	68.5.
BAN LEK	4136	74.1	2799	60.2
BAN NON SUNG	3240	60.5	3033	52.7
BAN LAO YAI	1724	52.5	4357	68.1
TOTAL SAMPLE	4157	70.1	4205	66.5

it is much less significant. Again the relative importance of the various sources in the composition of total cash income varies with the particular conditions prevailing each year. In the study area as a whole, the contribution of off-farm sources to cash income was dominant in 1970-71, with 40.7% compared with the 25.9% contribution from crops. The slight revival of crop prices and the higher production levels in 1971-72 gave crop production a slight advantage - 33.8% against the 33.7% of the off-farm sources.

The distribution of cash income by source reveals significant differences between the survey villages. In 1970-71 the pattern suggested that only Ban Tum could be said to have a strongly developed cash crop economy with as much as 53.7% of cash income emanating from crops. Here the large area of upland available had encouraged the cultivation of kenaf by most families. In no other villages did crops contribute more than 25%. The position of Ban Tum was confirmed by the evidence of 1971-72, but in this year it was joined by Ban Lao Yai where favourable environmental conditions allowed a heavy yield and sale of non-glutinous rice. The details presented in Tables III-10 and III-10a confirm the importance of income from sale of livestock in the southern villages, of off-farm income in those close to Kalasin town and of remittances in Ban Fai Taek and Ban Lek, where as will be shown in more detail below, population pressure and out migration seem to be strongest.[52] (Figure III-6).

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52. See below, Chapter IV.

FIGURE III-6
CASH INCOME : BREAKDOWN BY SOURCE
LAM PAO VILLAGES 1970-71 AND 1971-72

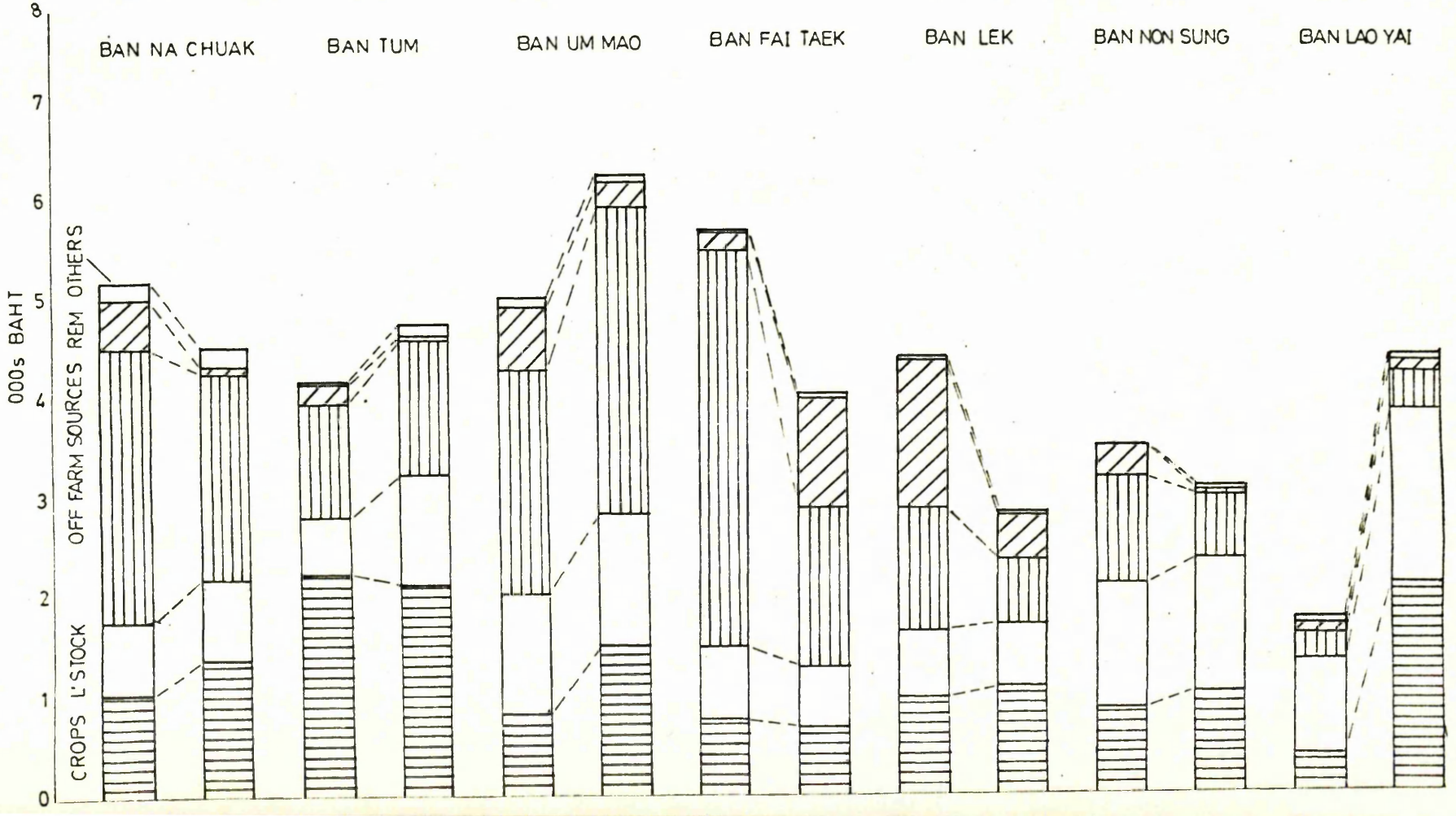

TABLE III - 10

Cash Income by Source

Lam Pao Survey Villages 1970-71

VILLAGE	% CROP INCOME	% LIVESTOCK INCOME	% OFF-FARM INCOME	% REMITTANCE INCOME	% OTHER
BAN NA CHUAK NUEA	19.7	14.3	53.4	9.9	2.4
BAN TUM	53.7	13.7	27.3	5.2	0.1
BAN UM MAO	16.0	24.9	44.4	13.1	1.6
BAN FAI TAEK	13.1	13.1	70.1	3.4	0.3
BAN LEK	22.4	14.7	28.1	34.3	0.5
BAN NON SUNG	24.2	36.0	31.1	8.7	-
BAN LAO YAI	20.7	54.9	14.6	5.3	4.5
TOTAL SAMPLE	26.9	19.0	40.7	12.5	0.9

TABLE III - 10a

Cash Income by Source
Lam Pao Survey Villages 1971-72

Village	Mean Cash Income	% Crops	% Livestock	% Off-Farm	% Remittance	% Other
Ban Na Chuak Nuea	4498	30.3	18.0	46.0	1.4	4.3
Ban Tum	4717	44.6	25.7	28.5	0.3	0.9
Ban Um Mao	6206	23.8	21.2	48.0	4.2	2.8
Ban Fai Taek	3992	16.9	14.8	40.4	27.5	0.4
Ban Lek	2799	37.5	22.3	23.7	14.8	1.7
Ban Non Sung	3033	33.3	44.0	20.0	2.1	0.6
Ban Lao Yai	4357	47.5	39.8	8.6	2.3	1.9
Total Sample	4205	33.8	24.9	33.7	5.6	1.8

The Agricultural Economy

Although agriculture does not hold the most important place in terms of hard cash, it is nevertheless the most important element in the economy of the Lam Pao area. It has been seen to be the chief source of gross income, very few of the villagers do not regard agriculture as their most important means of livelihood and even for the few, school-teachers, policemen, workers at the Lam Pao dam site, agriculture still provides the basis of their subsistence. Within agriculture, in the Lam Pao area as in the Northeast as a whole, the cropping pattern is dominated by lowland rice cultivation, mainly of the glutinous variety. Of the total planted area recorded in the Lam Pao sample survey (1970-71), some 81.6% was under paddy. This is higher than the percentage for the Northeast as a whole, but is rather lower than for Kalasin province where rice covered 94.9% of the planted area according to the Agricultural Census in 1963[53] and was still as high as 89.1% in 1970.[54] Once again, the figures in the sample survey were affected by the lower percentage recorded in Ban Tum. (Table III-11). Glutinous rice accounted for 97.5% of the 3247 rai of paddy planted in 1970 which compares very well with the 94.6% for Kalasin province in the same year.[55]

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53. National Statistical Office, "Census of Agriculture of Thailand 1963, Kalasin Province Volume", Bangkok 1964 Table 6 , p.19.

54. Department of Agricultural Extension, "Phaen-Thii Songserm Karn Kaset Phak Tawan-Ork Chiang Nuea 2515-19," Bangkok 1971.

55. Ibid.

TABLE III - 11

Paddy; Average Planted Area and % of Total Planted Area

Lam Pao Survey Villages 1970-71 and 1971-72

VILLAGE	1970-1				1971-72			
	AREA PLANTED IN RICE (RAI)	% TOTAL PLANTED AREA	% GLUTINOUS	% NON-GLUTINOUS	AREA PLANTED IN RICE (RAI)	% TOTAL PLANTED AREA	% GLUTINOUS	% NON-GLUTINOUS
BAN NA CHUAK NUEA	15.4	83.0	82.6	0.4	19.1	81.5	77.8	3.7
BAN TUM	11.8	68.8	68.5	0.3	13.0	68.2	65.0	3.2
BAN UM MAO	17.4	92.1	88.2	3.9	16.1	95.6	82.0	13.6
BAN FAI TAEK	9.6	81.7	80.2	1.5	9.8	93.2	92.0	1.2
BAN LEK	11.9	85.6	84.4	1.2	12.0	82.4	81.2	1.2
BAN NON SUNG	15.9	84.4	81.6	2.8	17.2	92.7	81.8	11.9
BAN LAO YAI	12.0	83.2	70.4	12.8	13.6	77.1	49.1	28.0
TOTAL SAMPLE	14.0	81.6	79.6	2.0	14.5	72.2	66.2	6.0

The average area of rice land held by families in the sample survey was 14.0 rai (planted area 13.5 rai) although this varies quite significantly between individual villages. In the upland area near the dam site, Ban Na Chuak Nuea had an average holding of 18.0 rai (planted area 15.4 rai) and here land is still being cut from the forest. At the flood plain sites too holdings are rather larger than the overall average figure, whereas in the central part of the project area on the low terrace, long occupation of the easily cleared land has reduced holdings to an average size of less than 12 rai. Moreover, as Table III-12 shows, over 50% of holdings in the three low terrace villages are less than 10 rai.

The concentration of resources in glutinous rice cultivation applies not only to land but equally to other inputs. Of the total investment in agriculture of 153.2 mandays per household per year, 72.9% was concentrated in glutinous rice cultivation. Of cash inputs in agriculture, consisting of hired labour, fertilisers, insecticides, land rent and tractor hire, an even higher proportion, 83.3% was invested in glutinous rice.

The heavy investment in rice cultivation in Lam Pao is rewarded by a level of production slightly above that for the Northeast as a whole. In 1970 this stood at 248 kilogrammes per rai and locally Kalasin changwat boasted a yield of 250 kilogrammes per rai.[56] By comparison, the yield for the Lam Pao survey households for glutinous rice reached 259.7 kilogrammes per rai, although non-glutinous rice was rather lower at 247.4 kilogrammes. The 1970-71 crop season was a generally good year for the area, but

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56. Department of Agricultural Extension, op.cit.

TABLE III - 12

Glutinous Rice: Size of Holding
Household Distribution
Lam Pao Survey Villages 1970-1971

VILLAGE	0	0 -5	5 -10	10 -15	15 -20	20 -25	25 -30	30 -35	35 -40	40+	
					Rai						
					No. Cases						
BAN NA CHUAK NUEA	1	1	12	8	5	2	-	3	2	1	
BAN TUM	-	5	30	10	5	4	-	3	-	-	
BAN UM MAO	-	1	11	7	7	3	-	3	3	-	
BAN FAI TAEK	-	9	7	4	2	1	2	-	-	-	
BAN LEK	-	6	18	6	8	3	1	-	-	-	
BAN NON SUNG	-	6	9	5	4	2	3	3	1	-	
BAN LAO YAI	-	2	4	3	2	-	-	-	-	-	
TOTAL SAMPLE	1	30	91	43	33	15	6	12	6	1	238

flooding was a problem in the lower land. Thus the yield in the extreme southerly village of Ban Lao Yai was depressed to only 212 kilogrammes for glutinous rice and was as low as 136 kilogrammes for non-glutinous. The following year, by contrast, favoured the lower land. 1971-72 tended to be a year of rather later rains and the more upland villages suffered from a degree of drought, especially at Ban Na Chuak Nuea despite the receipt of supplementary irrigation over part of the village land. Table III-13 shows the distribution of yields by village for the respective crop seasons.

Despite the heavy investment of land, labour and capital into rice, it is not the dominant cash crop in the economy. In fact its contribution to cash income was no more than 15.8% of the total income from crops recorded in the survey. Again the proportion varies from village to village, with Ban Um Mao and Ban Non Sung receiving a substantial proportion of their agricultural cash income from paddy. Overall, however, the heavy concentration of resources into glutinous rice cultivation is still a function of its importance as the staple subsistence crop. In 1970-71 only 10.3% of the total glutinous rice production caught in the sample survey actually entered the market and in Ban Lao Yai none of the families interviewed had sold rice at all in that year. In Ban Tum too the subsistence attitude was equally marked with only 5.4% of all production entering the market. It must be noted however that, in 1970-71 the price of rice was excessively low and it was clear that a number of farmers with adequate storage facilities were holding

TABLE III - 13

Rice Yield By Village

Lam Pao Survey 1970-71 and 1971-72

VILLAGE	1970-71		1971-72	
	GLUTINOUS	NON-GLUTINOUS	GLUTINOUS	NON-GLUTINOUS
	(Kilogrammes per rai planted)			
BAN NA CHUAK NUEA	266.2	143.3	224.7	198.4
BAN TUM	242.6	400.0	238.4	286.9
BAN UM MAO	265.7	257.7	316.1	281.0
BAN FAI TAEK	301.9	240.0	313.1	333.0
BAN LEK	255.2	257.1	262.1	271.0
BAN NON SUNG	265.1	365.7	291.3	296.3
BAN LAO YAI	212.4	136.3	330.2	545.8
TOTAL SAMPLE	259.7	247.4	266.4	330.7

back their sales.[57] In this case perhaps conditions in the following year were more typical. Then some 15.7% of paddy was sold with several villages registering much higher levels of sale. (Table III-14). On the other hand, it is clear that for most farmers sale does remain a matter of disposal of an irregular surplus. Few sell more than half of their crop and even in years of plenty a major proportion is held over for store against crop loss in future years. (Table III-15).

The Cash Crop Economy : Kenaf

A variety of cash crops are now grown in the Lam Pao project area, including maize, water melons and cassava, but the major component of cash income from crops in the area is produced by kenaf. As was pointed out in the previous chapter, the spread of kenaf cultivation into the Northeast region has been a relatively recent phenomenon and most farmers in the Lam Pao area have only been cultivating the crop for a period of about fifteen years.

Kenaf, like paddy, is grown in the Lam Pao area mainly as a wet season crop, although there have been cases of its cultivation in the dry season in the bottom lands along the Lam Phan river. Although grown in the wet season it does not compete with the paddy for the lowland and is normally grown some distance from the village sites on the higher areas of

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57. As was noted in Section II of the present chapter, it seems probable that there was also some underenumeration of the amount of rice sold in this year, particularly in the pre-harvest period, when a number of farmers are accustomed to sell off stock before the price falls. See also Chapter VII.

TABLE III - 14

% Paddy Production Sold

Lam Pao Survey Villages 1970-71 & 1971-72

VILLAGE	GLUTINOUS RICE		NON-GLUTINOUS RICE	
	1970-71	1971-72	1970-71	1971-72
BAN NA CHUAK NUEA	10.3	17.5	53.5	96.8
BAN TUM	4.8	12.5	100.0	99.0
BAN UM MAO	17.4	25.1	36.1	94.7
BAN FAI TAEK	6.7	3.2	54.2	100.0
BAN LEK	10.1	17.0	-	47.6
BAN NON SUNG	13.1	16.5	76.6	86.3
BAN LAO YAI	-	-	-	88.2
TOTAL SAMPLE	10.3	15.7	44.8	89.1

TABLE III - 15

Glutinous Rice: % Production Sold Household Distribution

Lam Pao Survey Villages 1970-71

MILLAGE	%						
	0	0-10	10-20	20-30	30-40	40-50	50+
	No. Cases						
Ban Na Chuak Nuea	26	2	3	-	2	-	2
Ban Tum	50	1	-	4	1	1	-
Ban Um Mao	16	6	1	5	4	2	1
Ban Fai Taek	20	1	2	1	-	-	1
Ban Lek	32	1	4	2	1	1	1
Ban Non Sung	25	1	-	2	4	1	-
Ban Lao Yai	11	-	-	-	-	-	-
Total Sample	180	12	10	14	12	5	5

sandy soil above the valley floor. In the more open parts of the study area, along the flood plain of the Lam Chi, these higher sites are provided by the terrace areas, but these are limited and fewer farmers cultivate the crop on smaller holdings. Only here is there any competition for potential paddy land and normally the kenaf crop does not compete with rice for the attention of the farmer. In the Lam Pao area the kenaf is normally in the ground by May at the latest and is cut in September or October prior to the paddy harvest. As elsewhere, if a clash does occur, it is to the detriment of the kenaf.

Looking at the situation in the Lam Pao study area in more detail, in 1970-71, of a sample of 258 farmers studied, 141 or 59.2% actually cultivated kenaf, one farmer in Ban Na Chuak Nuea concentrating on this crop alone. This would appear to be a typical figure, for in the following season, 149 kenaf farmers (61.3%) were recorded.[58] Amongst the 141 farmers of 1970-71 the average holding was just 5.0 rai per farm household, giving a total area under kenaf of 705 rai. This compares with 3329 rai of paddy land of both glutinous and non-glutinous rice and represents just 17.3% of the total planted area.[58]

As was suggested above, there was a considerable difference among the sample villages in terms of their

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58. The following season saw a slight decline to 676 rai of kenaf, giving it 15.7% of the planted area. This does appear to be an initial indication of a movement out of the crop, for by 1972-73, the area had fallen again to 663 rai, 14.3% of the planted area, and the proportion of kenaf growers was down to 46.2%. Some farmers had switched to cassava, but see below for further discussion.

commitment to kenaf. The largest holdings, combined with the greatest proportion of the sample growing the crop, are to be found in the northern part of the study area in Ban Na Chuak Nuea and Ban Tum. In the central area a lack of suitable upland reduces the number of participants to as low as 28.6% in Ban Um Mao and in Ban Lek and particularly Ban Fai Taek, farmers have to travel some distance to find available land. In this area it is probable that kenaf cultivation as a source of cash income is not an attractive alternative to the off-farm labour opportunities available in the town. Further away from Kalasin in the Chi flood plain, once again participation in kenaf farming increases, but here the land available is very restricted and holdings are small. (Table III-16).

It was suggested in the previous chapter that kenaf cultivation in the Northeast region involved little commitment on the part of the farmer and in this respect the Lam Pao area is no exception. It is true that it takes up a slightly disproportionate amount of the farmers' time in that it claims 23.2% of the labour inputs, but this can be explained by the heavy inputs required to harvest kenaf and process it. On the other hand, capital investment is low, with only 14.6% of total investment given to the crop, mainly in the form of hired labour. Only three farmers out of the whole sample in 1970-71 judged it worthwhile to apply fertiliser to kenaf.

As Table III-17 suggests, however, there is a marked difference between the attitudes of the northern villages and the rest. In the north of the study area kenaf does seem a viable proposition. In both Ban Na Chuak Nuea and Ban Tum the proportion of cash inputs invested in kenaf

TABLE III - 16

Kenaf: Proportion Farmers Growing
And Average Holding Size
Lam Pao Survey Villages 1970-71 & 1971-72

Village	1970-71		1971-72	
	% Farmers Growing	Average Holding (Rai)	% Farmers Growing	Average Holding (Rai)
BAN NA CHUAK NUEA	51.4	6.3	62.2	4.9
BAN TUM	89.5	5.9	93.3	6.2
BAN UM MAO	28.6	3.6	28.1	1.5
BAN FAI TAEK	40.0	3.6	30.4	5.0
BAN LEK	42.9	4.4	64.3	3.6
BAN NON SUNG	75.8	3.9	56.8	2.6
BAN LAO YAI	81.8	2.6	58.3	3.4
TOTAL SAMPLE	59.2	4.9	61.3	4.5

cultivation is higher than in the other villages except Ban Lek.[59] It is true that the figures for Ban Na Chuak Nuea are greatly inflated as a consequence of one particular farmer employing hired labour throughout the season, but this makes only a partial difference and investment is generally higher. In other villages by contrast investment in kenaf is negligible.

The lack of commitment to kenaf is scarcely surprising if the average yields experienced in the Lam Pao area are examined. (Table III-17). In no case do the yields recorded in the sample survey compare with the average for Kalasin province quoted in 1968 as 250 kilogrammes per rai[60] and only three villages come within 60% of this figure. The high investment of both materials and labour in Ban Tum was repaid in 1970-71 by fairly good yields and the return on the land in both Ban Lek and Ban Fai Taek is reasonable. Elsewhere yields can only be described as poor. The recently cleared land in Ban Na Chuak Nuea suffered heavily in 1970-71 from weeds and pests and in Ban Um Mao and the two villages in Kamalasai district the so-called upland was subject respectively to flood and drought. It may be noted that by the crop season 1972-73 the farmers in these southern villages had begun to withdraw from kenaf cultivation, saying that the land was nearing exhaustion. Even in 1971-72, the yield in Ban Non Sung had fallen to 60.3 kilogrammes per rai, while Ban Lao Yai farmers were obtaining as little as 45.1

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59. In Ban Lek cheap access to tractor ploughing by a former member of the village may be held responsible for the rather higher investment levels than in the northern area.

60. Department of Agricultural Extension, "Satiti Karn Pluuk Phuet Rai Lae Phuet Phak. Pii 2511", Bangkok 1971, p.97.

TABLE III - 17

Kenaf: Average Inputs and Yield Per Rai
Lam Pao Survey Villages 1970-71

Village	Total Cash (Baht)	Cash Per Rai (Baht)	Total Labour (Mandays)	Labour Per Rai (Mandays	Yield (Kgs/ Rai)	Return Per Rai (Baht)	Return Per Manday (Baht)
BAN NA CHUAK NUEA	229.2	36.5	71.2	11.3	112.0	204.2	18.0
BAN TUM	55.1	9.3	78.7	13.3	220.7	422.2	31.7
BAN UM MAO	29.2	8.0	34.5	9.5	113.9	254.9	27.0
BAN FAI TAEK	-	-	57.9	16.1	152.1	329.5	20.5
BAN LEK	41.7	9.5	43.5	9.9	148.5	306.7	30.9
BAN NON SUNG	14.3	3.7	44.3	11.5	79.1	156.5	13.6
BAN LAO YAI	-	-	40.1	15.7	78.3	167.2	10.7
TOTAL SAMPLE	58.1	12.2	60.1	12.4	160.4	313.1	25.3

kilogrammes.[61]

It would appear from this evidence that, for certain of the villages in the project area at least, kenaf does not provide a very productive factor of diversification for the farm economy. On the other hand, there were few other elements of diversification within the overall cropping pattern in the 1970-71 season. Table III-18 presents the total area planted to crops other than rice and kenaf in that season. The total amounts to no more than 46 rai and of that 21.5 rai is accounted for by fruit orchards. Indeed of the actual field crops the element of diversification which does exist appears largely to be a diversification of subsistence rather than a diversification of commercialisation. Little was grown for sale other than the 4 rai of water melons and the tiny experimental plots of peanuts and soya beans from Ban Na Chuak Nuea, all the rest being intended for home consumption as food or, in the case of the cotton, mulberry and kapok, as raw material for local handicraft industries.[62]

In the following season, 1971-72, a new element was introduced into the local cropping pattern, with the adoption of cassava by a number of farmers in the northern part of the project area. This followed experiments by selected village leaders in the previous year (not caught in the sample survey).

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61. By 1972-73 the sample recorded only 12 rai of kenaf in Ban Non Sung giving 5 farmers yields of only 26.7 kilogrammes per rai. In Ban Lao Yai yields were again only 47.6 kilogrammes. Even in Ban Tum there had been a fall to 150.2 kilogrammes and by 1974 farmers there were deliberately leaving their upland fallow.

62. The subsistence nature of these crops was confirmed in conversations with village leaders, particularly in Ban Lek and Ban Lao Yai. The suggestion that the local maize, cotton and peanuts might be sold was treated with some derision. They were 'only for sweets and cloth'.

TABLE III - 18

Area Planted in Crops Other Than Rice & Kenaf

Lam Pao Survey Area 1970-71 & 1971-72

Crop	1970-71 Area (Rai)		1971-72 Area (Rai)
Fruit	21.50		52.75
Water Melon	6.00		16.00
Maize	4.80		5.38
Cotton	2.80		5.75
Kapok	2.00		-
Mulberry	1.00		4.25
Peanuts	0.30		1.75
Soyabean	0.30		-
Vegetables (Misc.)	1.50		-
		Cucumber	9.50
		String Bean	5.13
		Chillies	3.75
		Onions	2.99
		Garlic	1.00
		Tobacco	0.45
		Cassava	27.00
Others	5.80		7.00
	46.00		142.70

In 1971-72 the recorded acreage within the sample of farmers was a mere 27 rai distributed between six households.[63]

In essence the adoption of cassava is a sign of dissatisfaction with the return from kenaf in terms of the labour investment required, but it also represents a small shift away from the concentration of agricultural activity entirely in the wet season. Cassava, with its 10-14 month maturation period is a more flexible enterprise than is kenaf and can be planted and harvested to reduce pressure in the annual labour cycle. At present, however, most farmers seem to regard it as a September-September or October-October regime. Cassava is, moreover, a substitute for kenaf and like kenaf is taking advantage of the extension of cultivation to the rather infertile upland, where it has been noted fertility is already declining. On the lowland the traditional pattern of rice monoculture and almost exclusive concentration of agriculture in the wet season still dominated the scene in 1970-71. Then the only significant amount of dry season cropping in the sample survey was found in Ban Um Mao where some 12 rai of vegetables and water melons were being grown, partly fed by water from the nearby irrigation tank, partly from the Lam Phan river. Irrigated agriculture on a larger scale was present in Ban Na Chuak Nuea in 1971-2, where cucumbers, string-beans and other vegetables were the enterprise. Although almost 50% of the sample were participating, however, the small size of the plots meant that the total area amounted to only 11.5 rai.

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63. In 1972-73 cassava had been taken up by nine farmers, growing 53 rai.

Dry Season Activities

The dry season, then, remains in the Lam Pao project area, as it has been, a time of non-agricultural activity. The season, which lasts from late December to late March or early April has traditionally been a time of leisure and renewal. It has been punctuated by a number of important village ceremonies involving the celebration of the successful completion of the harvest, the Buddha's birth and death anniversary, the foundation day of the Chakri dynasty, the Thai new year ('wan songkhran') and towards the end of the dry season the 'ngaan bongfai' or rocket festival which is basically a rain-making ceremony for the new crop season. Observations in the Lam Pao study area suggest that such festivals still play an important part in life during the dry season and they are also accompanied by others involving individuals, such as marriage ceremonies, or peculiar to single villages.[64]

In addition to its ceremonial aspects, the dry season has been a time for renewal. This has included any repairs which might be necessary to the family dwelling or rice barn and to equipment used on the farm, as well as, at the community level, repairs to the temple or road leading to the village. In relation to the latter communal tasks each family is expected to make its fair contribution of labour. Renewal might also be the theme of the traditional handicraft activities and it is common to see the looms for weaving silk and cotton cloth only

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64. In Lam Pao a typical example was the case of a daughter village of Ban Tum in the upland district of Somdet returning en masse to pay its respects to and worship at its parent village - the 'ngaan phaya phra paa'.

reconstructed for the dry season. The women, of course, dominate the handicraft industries in the village; for the men a favourite activity is fishing which helped to supplement the family diet during this period.

In the Lam Pao project area at the present time these traditional dry season activities appear to be under some pressure. Certainly as Table III-10 has shown neither fishing nor handicraft manufacture makes any substantial contribution to the total family income, except in a very few cases. It might be thought that in both instances such pursuits do provide a hidden source of income in terms of cash saved on purchased goods, but increasingly farm families are turning to the market for their needs. Although some 66.4% of farm families in the sample survey did take part in fishing at some stage of the year, few record catches of any size and for many the activity has turned towards a leisure occupation. Only in the villages near the reservoir, such as Ban Na Chuak Nuea, does fishing seem a major economic activity and even here there is a tendency towards specialisation by a few households.

In the case of the handicraft industries, the absence of significant areas of land now planted to cotton or mulberry reveals a decline in the incidence of such activity. Most villages are now within easy reach of the Kalasin market and it is as cheap to purchase ready-woven cloth there as it is to make it. If the cloth is woven in the home, it is now common practice to purchase yarn and dyestuffs from the market. Within the study area possibly only Ban Lao Yai lies sufficiently far from such sources to make a handicraft industry worthwhile and here silkworms are reared and both silk and cotton cloth woven more widely than elsewhere. On the whole, however,

the practice, with the exception of the manufacture of rush matting and the stuffing of pillows, mattresses and the like with kapok, would appear to be making less and less contribution to family income and may rather now be appearing more frequently on the debit side of budgetary calculations. Once again there is a strong element of leisure activity in the continued practice of weaving, especially among the young women of the village.

Just as fishing is becoming a more specialised activity and handicrafts begin to succumb to the competition of the local market in manufactured wares, so other dry season activities are tending to show a distinct concentration in the hands of a few specialist entrepreneurs. These often belong to individual villages, although their activities usually extend over a wide area. Thus house-building and repair in Ban Um Mao is now mainly in the hands of one local farmer turned carpenter and in Ban Lek, a team of painters has been established which dominates such work in the surrounding villages and even further afield. Such occupations are, of course, reflected in the increased importance of off-farm earnings noted earlier. In that some such sources of employment lead to permanent and semi-permanent residence away from the village they are equally reflected in the extent of remittances received in some villages. It is the young and vigorous who are so engaged and many now spend their dry seasons in this way, whereas the traditional activities are increasingly dominated by the more elderly members of the community and the very young.

The picture of the Lam Pao irrigation project area presented in this general description has sought to show an area in transition between the traditional subsistence economy

and a modern market-oriented system. The economy of the Lam Pao area is still dominated by the need to ensure the subsistence glutinous rice crop in sufficient quantity each year for all the family consumption requirements. At the same time, the aspirations of the population, particularly of the younger section, are growing rapidly. The spread of the knowledge of the growing prosperity of Bangkok and even regional centres within the Northeast with the now widespread access to the mass communications media and greater ease of travel has shown to the people of this area the advantages of a cash income and most families are today striving to achieve this.

It is clear that, at the present time, the majority of farm households within the study area do not see agriculture as the easiest means of satisfying their new material desires. Only a few of the larger landowners sell more than a limited proportion of their rice production; most seek merely to assure their subsistence needs and sell only the surplus that may materialise in a favourable year. What participation there is in cash cropping has not taken place at the expense of rice cultivation and there seems to be little likelihood of a move away from the subsistence cultivation of rice. At the present time the price of rice to the consumer in Thai markets is high compared to the price received at the farm gate and very much so in relation to current production costs. The opportunity cost of abandoning rice production may be summarised with reference to Table III-19.

Movement into cash cropping has indeed been made by the extension of cultivation onto the uplands unsuitable for rice. The indications are, however, that such a spread of kenaf (or cassava) cultivation may not be a viable long-term means of

TABLE III - 19
Opportunity Cost of Rice Cultivation
Lam Pao Survey Area 1970-71

1.	Average Yield Glutinous Rice		259.2 kilogrammes per rai
2.	Cost of Production	(a) Cash Inputs	15.2 baht per rai
		(b) Labour 8.5 mandays @ 8 baht per manday	68.0 baht per rai
		TOTAL PRODUCTION COST	83.2 baht per rai
		∴ Cost Per Kilogramme	0.32 baht
3.	Farm-Gate Paddy Price		0.51 baht per kilogramme
4.	Market Price of White Rice.		c. 1.40 baht per kilogramme
5.	Consumption Requirements for Average Family of Seven		2310. kgs Paddy
	At 50% Milling Ratio		1155 kgs White Rice
6.	Cost of Purchase	Paddy in Village	1178 baht
	Cost of Purchase	White Rice at Market	1617 baht
		Less Milling Cost 0.1 baht per kilogramme	1501 baht
	Cost of Production		739 baht
7.a.	Advantage over Village Purchase of Paddy		439 baht
b.	Advantage over Market Purchase of Rice		736 baht
8.	No. Mandays to Produce Consumption on Farm		75.75 mandays
9.a.	Return over 8 baht per manday required to make 7.a. worthwhile		5.80 baht per man-day
b.	Return over 8 baht per manday required to make 7.b. worthwhile		9.72 baht per manday

diversification. Diversification within the context of the lowland has been strictly limited. Farmers are constrained by unfavourable price levels, lack of marketing channels and the unreliable weather from adopting new crops. In the wet season the need to ensure the rice crop is paramount; in the dry season, the traditional activities and lack of water have been the constraints on agriculture; at present the return from off-farm labour is a more reliable source of cash income than agriculture.

It is ironic that some of the opportunities for off-farm employment in the Lam Pao area should be coming from the construction of the irrigation system itself, but it is only through the extension of these facilities that the basic cause of the farmers' reluctance to diversify, even in the wet season, will be solved. The increased reliability of paddy cultivation with assured water supply from irrigation should lead to higher yields and release land for other crops. However the mere provision of the physical facilities of an irrigation system will not, in itself, be sufficient to induce this change. The farmers of the Lam Pao project area have long used their resources in response to particular environmental conditions and limited aspirations. They now must be persuaded into new attitudes, to the acceptance of new techniques of cultivation and this requires a major re-assessment of the management of resources in agriculture.

In the chapters which follow therefore, the organisation of the traditional agriculture in the Lam Pao study area will be examined in greater detail. The two major factors of production in subsistence agriculture, land and labour, will be

investigated and evidence of apparent trends and constraints to change will be put forward. These issues occupy Chapters IV and V. In Chapters VI and VII the state of and the weaknesses of the capital market and the channels of sale for agricultural inputs and farm produce will be reviewed, while Chapter VIII will assess the role of government institutions and their ability to make a valuable contribution to the process of change. The final chapter will draw together the various points raised by the previous discussion and examine the problems and possible answers to the problems of the development of modern agriculture within an irrigation system.

CHAPTER IV

THE ORGANISATION OF LAND RESOURCES IN THE LAM PAO IRRIGATION AREA

In traditional agriculture the two basic elements of the farm economy are land and labour. In this chapter and the one following, the organisation of these two basic inputs in the farming system will be examined in the context of the Lam Pao project area. The two are inseparable: within certain limits, heavier application of labour can make up for relative deficiency of land resources. It is only for convenience of discussion that they are treated separately here. The pre-irrigation organisation of the particular production factor will be described and analysed in order to discover the factors which have influenced the existing form of that organisation. Attention will then be turned to developments which may be occurring with the introduction of irrigation facilities in Lam Pao and these will be compared with other developments elsewhere. From this likely changes in the organisation of the particular resource will be suggested, along with the problems inherent in those changes.

It is clear that to most small farmers in developing countries land is much the most important resource in agriculture. For most, it is land which measures their economic and social position in a society, although pastoral communities are natural exceptions to this. Land offers security; the lack of it leaves a farmer in an inferior position to his neighbours. Land is the very basis of the traditional cultivator's whole livelihood, the resource from which he

can provide the food to maintain himself and his family.

In a fully subsistence economy, a farmer is likely only to cultivate that amount of land which ensures an adequate subsistence level for his household. There is little point in acquiring more land resources to provide an annual surplus if there are no means through which to dispose of it. Few of the farmers of the Northeast of Thailand have moved far from this subsistence position. It is true that marketing facilities have penetrated the area, but for most farmers the primary aim is still the cultivation of sufficient land to satisfy their consumption needs.

'Sufficient land' is, of course, a relative concept. The amount of land to be cultivated can depend, as was noted above, very much on the amount of care a cultivator is willing to invest upon it in the form of labour inputs. It depends also on the farmer's subjective evaluation of his family's needs. It depends on the physical environment in which he is earning his living. Where, as in Northeast Thailand, a farmer is faced with extremely unreliable climatic conditions, he must take these into account in assessing his required investment in land resources. Land without water or with an excess of water can scarcely be considered as a resource. What is certain in all this, however, is that land resources must be considered very much in relation to the population which works them and is sustained by them.

It would appear that land resources in Northeast Thailand are adequate for the provision of food to support the 1.6

million farm families resident in the area,[1] as well as providing a substantial surplus for sale outside the region.[2] It is thought, indeed, that in the past certain parts of Northeast Thailand may have held a population denser than that of the present day.[3] It is still probably true to say that in the Northeast as a whole pressure of population on land resources is not at present a major problem, although it would appear that the average cultivated area per farm family has fallen steadily since 1950. In 1953, the Census of Agriculture recorded an average holding size for Kalasin province of 26 rai;[4] by the time of the subsequent agricultural census of 1963, the average holding had apparently fallen to some 20.4 rai;[5] in 1970 another source suggested an average holding size of only 10.8 rai per household.[6] This latter figure must be doubted, it being unlikely that population growth and household subdivision could have brought about such a rapid fall.[7]

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1. Department of Agricultural Extension, "Phaen-Thii Songserm Karn Kaset: Phak Tawan-Ork Chiang Nuea, 2515-2519." Ministry of Agriculture, Bangkok 1972.

2. See above, Chapter II.

3. Ingersoll,J., "Human Dimensions of Mekong River Basin Development: A Case Study of the Nam Pong Project, Northeast Thailand, 1967-68." USAID, Washington 1968, p.214.

4. Behrman,J.R., "Supply Response in Underdeveloped Agriculture: A Case Study of Four Major Annual Crops in Thailand 1937-63." Amsterdam 1968, Table III-2, p.68.

5. National Statistical Office, "Census of Agriculture of Thailand. 1963 Kalasin Province Volume," Bangkok 1964, Table 1, pp.12-13.

6. Department of Agricultural Extension (1972) op.cit.

7. Care must always be taken with the comparison of figures from different sources in Thailand, but nevertheless the overall trend would seem apparent.

Nevertheless during this period, it is clear that some parts of the Northeast did become subject to a degree of population pressure. As Ng[8] has shown, between 1955 and 1960 the long settled and densely populated valleys of the Mun and Chi rivers became centres of outmigration to the less densely populated and less agriculturally-favoured areas in changwats Loei, Chaiyaphum, Sakol Nakorn and Udorn Thani.

At the local scale too, in the Lam Pao area, it is clear that land resources are subject to varying degrees of population pressure and, as at the regional level, it is the longest settled, most favoured areas which have the greatest densities of settlement. Of the villages in the Lam Pao sample survey, therefore, it is the old established villages in the central low terrace area which have the highest densities with Ban Fai Taek rising to almost 55 persons per 100 rai of agricultural land. Ban Lek has a similar high density and so too has Ban Tum, although this is masked by the relatively large amount of recently cleared upland in this village. Indeed, a better representation of the relative position is given by population per rai of rice land and of rice land actually planted. (Table IV-1). Again the good, relatively well-drained soils of the low terrace area still stand out as the most densely populated areas. By contrast the upland site of Ban Na Chuak Nuea has the lowest density and here farmers are still in the process of cutting land from the forest for development as paddy. The low-lying village of Ban Um Mao with its easily flooded paddy also has a low density, as does Ban Non Sung, where clearance of low

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8. Ng, R.C.Y., "Recent Internal Population Movements in Thailand", A.A.A.G., vol. 59 (4), 1969, p.723 and Figure 3.

TABLE IV - 1

Lam Pao Survey Villages: Population Densities 1970-71

Village	Total Population	Total Area (Rai)	Density (Persons per 100 Rai)	Total Rice Area (Rai)	Density (Persons per 100 Rai)	Rice Planted Area (Rai)	Density (Persons per 100 Rai)
Ban Na Chuak Nuea	225	738.5	30.47	629.5	35.74	538.5	41.78
Ban Tum	354	947.7	36.82	669.4	52.88	578.2	61.22
Ban Um Mao	263	668.5	39.34	610.5	43.07	610.5	43.07
Ban Fai Taek	178	325.0	54.77	265.0	67.17	240.0	74.17
Ban Lek	279	583.8	47.79	498.4	55.97	498.4	55.97
Ban Non Sung	259	620.4	41.75	525.7	49.27	522.4	49.58
Ban Lao Yai	91	171.6	53.03	143.0	63.64	143.0	63.64
Total Sample	1649	4082.5	40.39	3341.5	49.35	3132.0	52.65

terrace land is also going on to supplement the inundatable flood plain land. Ban Lao Yai, on the other hand, appears to be unable to find land to add to its vulnerable holdings on the Lam Chi flood plain and has rather higher densities.[9]

The observations made above may be at least partially confirmed by reference to the proportion of each community's income deriving from its agricultural land. In Ban Fai Taek and Ban Lek the importance of off-farm income on the one hand and remittance income on the other is a fair reflection that here agriculture scarcely offers an adequate standard of living. In Ban Tum, although crop income is much more important, it is derived mainly from the upland cultivation of kenaf and, whereas 51 farmers in the sample of 57 in that village sold kenaf in 1970-71, only three sold any rice.[10] By contrast, where paddy land is in much greater supply, in Ban Um Mao and Ban Non Sung, the proportion of rice sold was 178% and 150% respectively.

Although it is clear that there is considerable variation in population densities in the Lam Pao irrigation project area and that in some villages there is little surplus rice for sale, it is not certain from the above discussion whether

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9. Indeed the situation in Ban Lao Yai seems to have been more critical than the figures suggest, due to the gross unreliability of production. It finally led, in late 1974, to 13 whole families from the village making a mass migration to changwat Phichit in the northern Central Plain.

10. And only 5.4% of total rice production was sold. See above, Chapter III, Table III-14. It may be noted also in Ban Tum, that the likely future problem of population growth and subdivision of holdings has become apparent to village leaders. The 'kamnan' felt that a family of five was the currently preferred norm in the village and he had encouraged the institution of a birth control programme. By 1974-75 the increase in population had fallen to a low rate of about 1.0%.

any parts of the area are having real difficulty in growing sufficient rice for family consumption requirements. It is true that in crop season 1970-71 a number of farmers did suffer total crop loss, notably in Ban Lao Yai, but these represented a very small minority. In terms of the use of land resources within the area as a whole it is necessary to examine more general figures of production and compare these with the level of rice consumption which may be taken as an adequate subsistence level (or above) for the area. This level of consumption is best examined on a per capita basis.

Numerous estimates have been put forward as to general consumption requirements for paddy in Thailand and specifically for the Northeast region. Vanrob notes Rice Department figures for 1964 which indicate a level of 189.4 kilogrammes of paddy for the kingdom as a whole.[11] However, it is clear that

> "..differences between town people and villagers in Thailand in per capita consumption of rice are striking." 12

and thus much more useful are the estimates given on a regional basis for both town and country by the National Statistical Office Household Expenditure Survey of 1962-63. This estimated a per capita consumption for villages in the Northeast of 187.6 kilogrammes of milled rice,[13] or the

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11. Vanrob Isrankura, "A Study of Rice Production and Consumption in Thailand" Division of Agricultural Economics, Ministry of Agriculture, 1967, p.19.

12. Ibid., p.26.

13. National Statistical Office, "Household Expenditure Survey 1962-3", Northeast Volume, Bangkok 1963, Table 10, p.53.

equivalent of 284.2 kilogrammes of paddy.[14]

These figures are now, unfortunately, rather old and they take into account only that part of household requirements actually used for human consumption. As Somnuk demonstrates, it is likely that non-human consumption requirements in the household (seed and animal feed) and actual loss to rodents and other pests would take up between 11% and 20% of total domestic consumption.[15] Such non-human needs and losses must also be taken into account in any assessment of total _per capita_ consumption requirements and recent studies have sought to do just this. In 1971-2, the National Statistical Office ran a pilot crop cutting survey with the intention of re-assessing paddy consumption requirement and available surplus on a national scale. Unfortunately the results of this survey were considered unsatisfactory in that the stock available for sale seems to have been underestimated.[16] A more recent study carried out at the Huay Sithon farm, however, has re-assessed consumption with much the same factors in mind and has come up with much more credible results. This study proposes a figure of 309.6 kilogrammes _per capita_ of paddy, including 6.5 kilogrammes for livestock feed and renting in kind, and 31.8 kilogrammes for gifts to the temple and to

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14. This is converted on the basis of a milling ratio of 66%. As was noted earlier (Chapter II, footnote 82), while this may be valid for larger urban mills, village mill rates are rather lower.

15. Somnuk Sriplung and Koset Manowalailao, "_The Demand for Rice for Domestic Consumption_", Bangkok 1972, pp.6-7.

16. Unpublished data for Kalasin province gave estimates of 626.9 kilogrammes for consumption.

relatives.[17] This seems a much more likely estimate of consumption if the lower village milling ratios are to be taken into account.[18]

It was noted in the previous chapter that the average rice yield over the seven villages studied in the Lam Pao sample survey in the 1970-71 crop season was 259.7 kilogrammes per rai. Thus, on the basis of the per capita consumption requirements calculated above, it may be said that a farm family might require 1.25 rai of land for every member of the household. On this basis, with an average household size in the survey area of 6-7 persons, between 7.5 and 8.75 rai would be sufficient to feed each family. It may be seen from Table IV-2 that in no village does the average size of family rice holding fall below the critical figure.[19]

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17. Ng. R.C.Y., "The Socio-Economic Conditions in Huay Sithon" Volume 1 : General Report, Report for F.A.O., London 1972, pp.17-18. mimeo.

18. In 1972-73 another investigation of the problem was made in connection with the Lam Pao sample survey. According to this, (see Dixon,C.J., "The Pattern of Rural Paddy Production and Consumption", Lam Pao Land Use Survey Report Series, No.5, London 1974), food requirements were 327.71 kgs., to which may be added store for seed of 10.77 kgs., gifts to the temple, totalling 11.96 kgs., paddy used to barter for other goods (6.33 kgs.), livestock feed 23.44 kgs., gifts to poor relatives of 34.35 kgs. and other non-sale uses amounting to 11.83 kgs. This gives a total per capita consumption of 416.39 kgs. which seems a little excessive and implies a very low milling ratio of c. 45% on the basis of white rice consumption estimates of c. 190 kgs.

19. In fact in 1972-73, the sample survey recorded an average rice holding in Ban Fai Taek of only 5.6 rai - more landless families and a reduction in rented area were enumerated - and in Ban Lao Yai of only 9.2 rai. In this year, however, Ban Fai Taek average yield had increased to 381.6 kgs. per rai.

TABLE IV - 2

Average Holding & Average Rice Holding

Lam Pao Survey Villages, 1970-71 & 1971-72

Village	1970-1		1971-72	
	Total Holding (Rai)	Rice Holding (Rai)	Total Holding (Rai)	Rice Holding (Rai)
Ban Na Chuak Nuea	21.1	18.0	23.5	19.1
Ban Tum	17.1	11.9	19.1	13.0
Ban Um Mao	18.9	17.4	16.8	16.1
Ban Fai Taek	13.0	10.6	10.5	9.8
Ban Lek	13.9	11.9	14.5	12.0
Ban Non Sung	18.8	15.9	18.3	17.2
Ban Lao Yai	15.6	13.0	16.0	13.5
Total Sample	17.1	14.0	17.6	14.3

However, if the individual family holdings are plotted against the size of family, as in Table IV-3, it will be seen that some 12.2% of households have rice holdings too small, apparently, to adequately feed themselves. This may, however, be compensated by a higher application of labour and higher yields, or by a transfer of resources from one household to another. On the village level, it is notable that where population pressure is highest, in Ban Fai Taek, so too is rice yield highest at some 302 kilogrammes per rai. At the individual farm level, the relationship between yield and labour inputs was examined in a regression analysis; from this a number of highly significant relationships were established, but these will be discussed below in more detail (Chapter V).

Although it may be said that, in general terms, the farm families in the Lam Pao project area should be able to fulfil their subsistence needs from 7-9 rai of paddy land, it is doubtful whether many farmers would regard this as an adequate size of holding for the purpose. Given the existing environmental conditions, most farmers feel that to ensure the provision of sufficient rice for family requirements it is necessary to plant a much larger area of paddy wherever this is possible. It was noticed above that the monthly rainfall at the Royal Irrigation Department stations in the district centres of Kalasin province has shown wide variations over the period of record. Although the coefficient of variability is lower during the wet season than during the dry season, it remains sufficiently high to pose serious risks to the farmers, particularly during the crucial period for land preparation and transplanting from May to July.

TABLE IV - 3

Rice Holding by Household Size
Lam Pao Survey Households
1970-71

Size of Holding (Rai) / Size of Household	0 - 5	6-10	11-15	16-20	21-30	31-60	Total Cases
	No. Cases						
Less than 4	7*	4	3	-	-	-	14
4	1	17	2	2	1	2	25
5	4	14	3	4	3	1	29
6	3	14	10	6	5	2	40
7	9	17	8	5	3	5	47
8	4	8	5	6	2	3	28
9	2	7	9	2	2	1	23
10	1	2	2	4	1	3	13
More than 10	-	5	3	3	5	3	19
Total Cases	31	88	45	32	22	20	238

* Households to left of dotted line likely to be short of land

It has been this unreliability of the timing and the amount of rainfall which has caused the farmers of the Lam Pao project area to develop and plant more paddy land than they actually need for subsistence. Although in recent years Kalasin has not been as badly affected by crop damage as other Northeastern provinces, Table IV-4 shows that between 1961 and 1973 the proportion of paddy planted area unable to be harvested has ranged from 0.1% to 11.4%.

In the two years of the Lam Pao sample survey, the percentage area of paddy lost in the villages studied was 16.6% in 1970-71 and 7.8% in 1971-72. The latter was a slightly better year than the former, when heavy rainfall caused extensive flooding in the lower lands. Table IV-5 shows the area lost in each of the study villages in the two years of the survey and it may be noted that the losses for the limited area of non-glutinous rice were even higher than for the glutinous variety.

The proportion of planted area lost does not supply the whole picture. It does not take into account that area of land which could not be planted either because of drought or because it was too deeply flooded. As Table IV-4 shows this is a more serious problem than the loss of land already planted, with as much as 36.4% of the holding area unable to be planted in 1964 and 33.7% in 1967. The Lam Pao sample survey for 1970-71 recorded 3.5% of the rice holding area not planted compared to a changwat figure of 1.4% in the same year. Nor does the previous calculation take into account land which could be harvested, but which was adversely affected by damage of some sort. In the Lam Pao sample survey, farmers were asked to assess what proportion of their land had

TABLE IV - 4

Kalasin Province: Rice Holding Not Planted & Planted Area Destroyed 1961-1973

Year	% Holding Not Planted	% Planted Area Destroyed
1961	9.1	5.9
1962	2.9	3.0
1963	12.9	3.9
1964	36.4	4.8
1965	12.0	11.4
1966	2.5	2.9
1967	33.7	11.0
1968	25.1	3.3
1969	3.7	5.5
1970	1.4	5.2
1971	1.6	0.1
1972	2.9	0.5
1973	14.6	5.5

Source: Ministry of Agriculture, Rice Department "Annual Rice Reports".

TABLE IV - 5

% Rice Planted Area Lost

Lam Pao Survey Villages 1970-71 & 1971-72

Village	Glutinous Rice		Non-Glutinous Rice	
	1970-71	1971-72	1970-71	1971-72
Ban Na Chuak Nuea	14.1	17.2	-	20.9
Ban Tum	13.9	1.4	-	8.3
Ban Um Mao	15.5	5.9	30.8	12.2
Ban Fai Taek	22.5	2.7	20.0	-
Ban Lek	23.8	7.4	42.9	-
Ban Non Sung	8.8	3.3	-	6.0
Ban Lao Yai	39.7	13.3	68.2	3.5
Total Sample	16.6	7.8	32.5	9.2

been damaged from various causes, drought, flood, insect pests, disease and other causes, such as crabs, rats and birds. Here, according to the nature of the land, the various villages and individual farmers could be affected in different ways, so that although the major problem in 1970-71 was flood, extensive holdings were affected by drought. Tables IV-6a and IV-6b show the proportion of planted area damaged by various causes by village for the seasons 1970-71 and 1971-72.

It is in this context, then, that the traditional organisation of land resources within the Lam Pao project area must be considered. Where flood may affect low-lying land in one year and where drought may damage the crop on the higher, drier land in the next, a farmer will be reluctant to commit all his resources onto one type of land. Unsure of what the environment holds in any one year, where possible the Lam Pao rice farmer has taken out an insurance policy by cultivating two or more plots in different parts of the village, each plot of a different physical type in terms of altitude, ease of drainage and soil type. Where he has only a single plot, he may have endeavoured to include within it land of different types too. Thus the tendency is for farmers to have more than one plot of paddy land. In the Lam Pao sample survey in 1970-71, 237 rice farmers had 338 plots of glutinous rice and 20 non-glutinous plots between them. In this year the price of non-glutinous rice was abnormally low, below that of the glutinous variety, and in 1971-72, what was probably a more normal pattern was to be found, with the 241 paddy farmers holding 318 plots of glutinous rice and 59 plots of nnn-glutinous. This gives an average number of paddy plots per farmer of 1.51 and 1.52 respectively. Table

TABLE IV - 6a

% Rice Planted Area Damaged by Various Agencies

Lam Pao Survey Villages 1970-71

Agency / Village	Drought	Flood	Insects	Other
Ban Na Chuak Nuea	22.0	19.5	9.8	-
Ban Tum	35.1	6.8	5.4	8.8
Ban Um Mao	8.2	32.7	12.2	6.1
Ban Fai Taek	45.6	14.8	3.7	3.7
Ban Lek	31.5	21.5	17.8	6.8
Ban Non Sung	14.3	16.7	2.4	-
Ban Lao Yai	8.3	50.0	-	-

TABLE IV - 6b

% Rice Planted Area Damaged by Various Agencies

Lam Pao Survey Villages 1971-72

Agency / Village	Drought	Flood	Insects	Disease	Other
Ban Na Chuak Nuea	15.3	0.2	3.2	2.2	0.6
Ban Tum	8.2	1.8	6.9	8.8	2.6
Ban Um Mao	5.3	3.9	7.6	1.4	4.2
Ban Fai Taek	11.6	-	3.1	19.4	1.0
Ban Lek	6.5	10.9	5.9	4.7	6.6
Ban Non Sung	6.5	1.8	10.1	6.6	0.6
Ban Lao Yai	2.2	14.5	6.8	2.4	4.1

IV-7, for crop season 1970-71, shows the number of paddy plots held by each household by village. Although 65.1% of farmers only have a single plot, 27.7% had two plots and as many as 16 had three plots or more.

The desire to hold land of different types may be illustrated by the spatial patterns of land holding within the Lam Pao project area. In Ban Non Sung, for example, the village land is composed of two main sections; the low-lying, extremely flat flood plain lands of the Lam Chi and sections of the older low terrace, rising some 2-3 metres above the flood plain and providing drier sites for villages like Ban Non Sung itself and Ban Na Bung. Paddy yields in the flood plain can be extremely high, rising to some 70-80 tang per rai.[20] Unfortunately this land is subject to severe flooding, especially in the vicinity of a shallow lake, Nong Bung, which contracts to almost nothing in the dry season, but which soon fills up in the monsoon. By contrast, the terrace land is not so fertile, yielding only 25-35 tang per rai and its problem is drought rather than flood.

As can be seen from Figure IV-1, a number of farmers in Ban Non Sung have sought insurance against the climatic conditions by owning plots both adjacent to the 'nong' and on the higher terrace land. It is, however, apparent that these farmers do have a definite scale of values vis-à-vis the different types of land and at present the advantage seems to lie with the higher plots. Although the lakeside plots are valuable for the early season development of seed beds - the soil here never fully dries up - the frequency of flooding

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20. 'Tang' is a Thai measure of volume, which in the Northeast usually weighs 10 kilogrammes of paddy; see glossary.

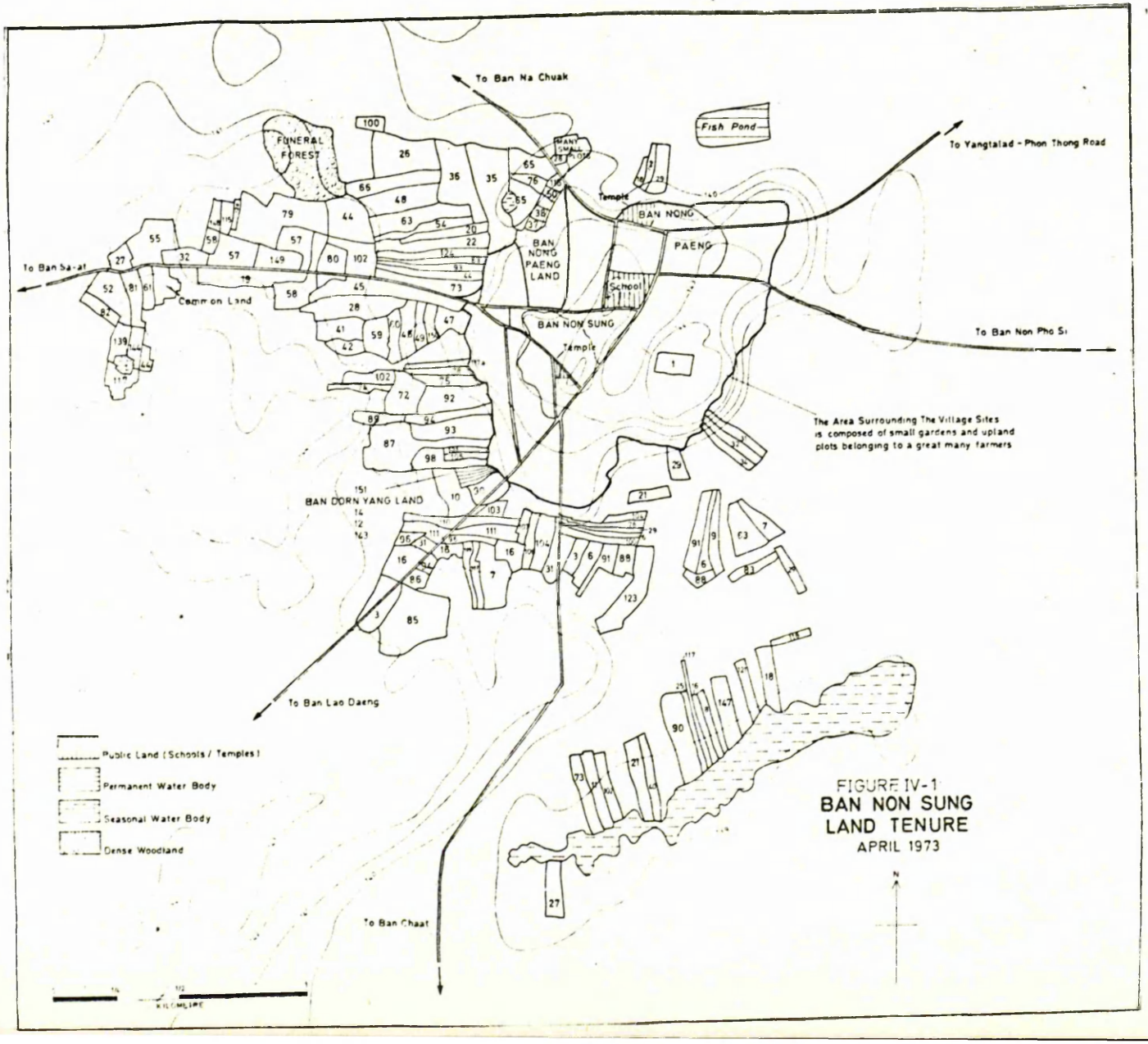


FIGURE IV-1
BAN NON SUNG
LAND TENURE
APRIL 1973

TABLE IV - 7

Number of Paddy Plots: Household Distribution

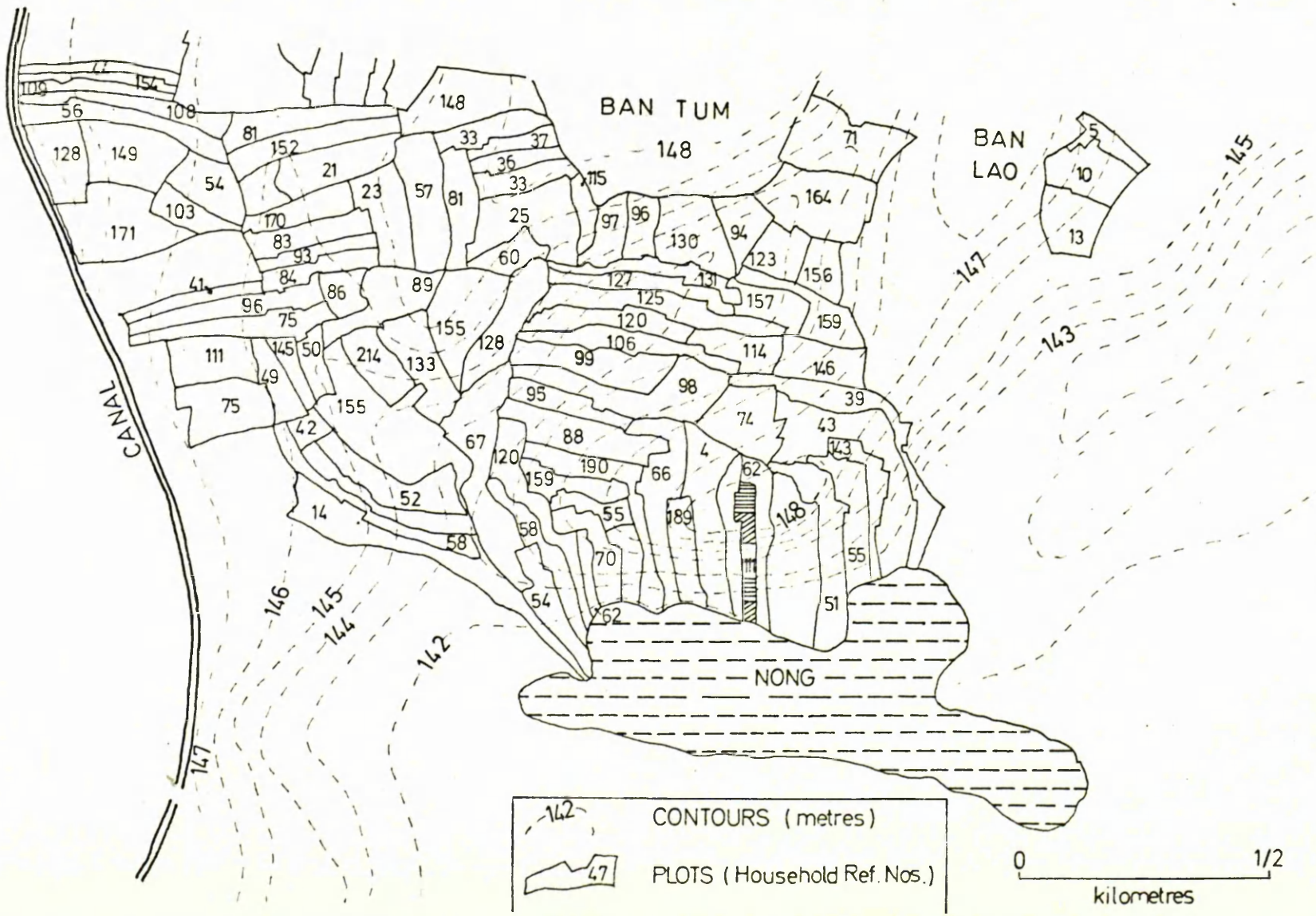
Lam Pao Survey Villages - 1970-71

Village	No. Plots 0	1	2	3	4+
	No. Cases				
Ban Na Chuak Nuea	1	27	6	1	-
Ban Tum	-	41	15	1	-
Ban Um Mao	-	20	12	2	-
Ban Fai Taek	-	22	2	1	-
Ban Lek	-	18	18	5	1
Ban Non Sung	-	20	11	1	1
Ban Lao Yai	-	8	2	1	-
Total Sample	1	156	66	12	2
% Total Sample	0.4	65.5	27.7	5.1	0.8

appears to outweigh the advantage of higher yields and the higher plots, albeit subject to drought, are felt to be more reliable. Farmer No. 27 (see Fig. IV-1) indeed had decided to rent out his 10 rai plot to the south of the lake because it was so low and unreliable. He was charging only 8 baht per rai rent and had recently purchased his other plot in the terrace from a farmer in nearby Ban Sa-at.

One farmer interviewed, No. 73, gave a particularly interesting insight into the current attitudes to these different land resources in the village. This farmer, a man of 54, was one of the richer men in the village, owning a total of 40 rai of land, 35 rai of paddy and 5 rai of upland. The paddy land was divided into two plots, 15 rai at the lakeside and 20 rai on the low terrace. Despite the fact that he felt he could get 80 tang per rai off the lakeside plot, the farmer said that this was very unreliable and since becoming a member of the Agricultural Credit Co-operative in 1968, he had borrowed 5000 baht to help purchase the 20 rai of then forested higher land and to hire labour to clear it. Since then, he said, he had been using the lower plot to grow non-glutinous rice, for sale rather than consumption; this, growing higher, was likely to be more resistant to flooding and if it did indeed flood, it did not effect his subsistence supply of glutinous rice. In 1970, in fact, not having enough labour to work both plots, he had allowed his brother to cultivate the plot rent free. Nevertheless, the farmer made it very clear that he was not willing to sell off the lakeside plot; it was an insurance in any year of particularly dry weather and even when worked by his brother, the production remained within the extended family and would be a safeguard for the

FIGURE IV-2 : BAN TUM - LAKESIDE LAND TENURE



owner in dire emergency. Thus the assurance of two different types of land was maintained. In Ban Non Sung as a whole, more and more farmers with only the low-lying land have been engaged in clearing higher plots on the terrace.

A somewhat similar situation is to be seen at Ban Tum. Here too there is a shallow lake to the south of the village, but unlike the flood plain area of Ban Non Sung, here the land rises more sharply from the 'nong' to the tune of about some 5 metres in about 100 metres. (Figure IV-2). Here flooding is not so widespread as in Ban Non Sung, but farmers do tend to use the lowest land for the cultivation of the less important non-glutinous rice. (Figure IV-3). The danger of flood on the lakeside plots is, however, sufficient to encourage farmers to develop or acquire land in other, higher parts of the village, but the presence of higher land close to the lake has led others to extend their plots in a sinuous fashion from the lakeside up to the higher ground to the north, thus including various types of land in the same plot. Some plots, of which No. 190 is a good example, actually run north and then turn sharply to the west to take advantage of the higher ground. The importance of this system of land holding is highlighted when the need arises to subdivide the holding between a number of heirs. In order to maintain a pattern whereby <u>each</u> of the heirs hold a variety of land, the original plot must be split lengthways, so creating a series of extremely narrow plots, often only a single field in width.[21]

Although in some of the villages studied, the premium of owning more than one plot is not so high, in that the village

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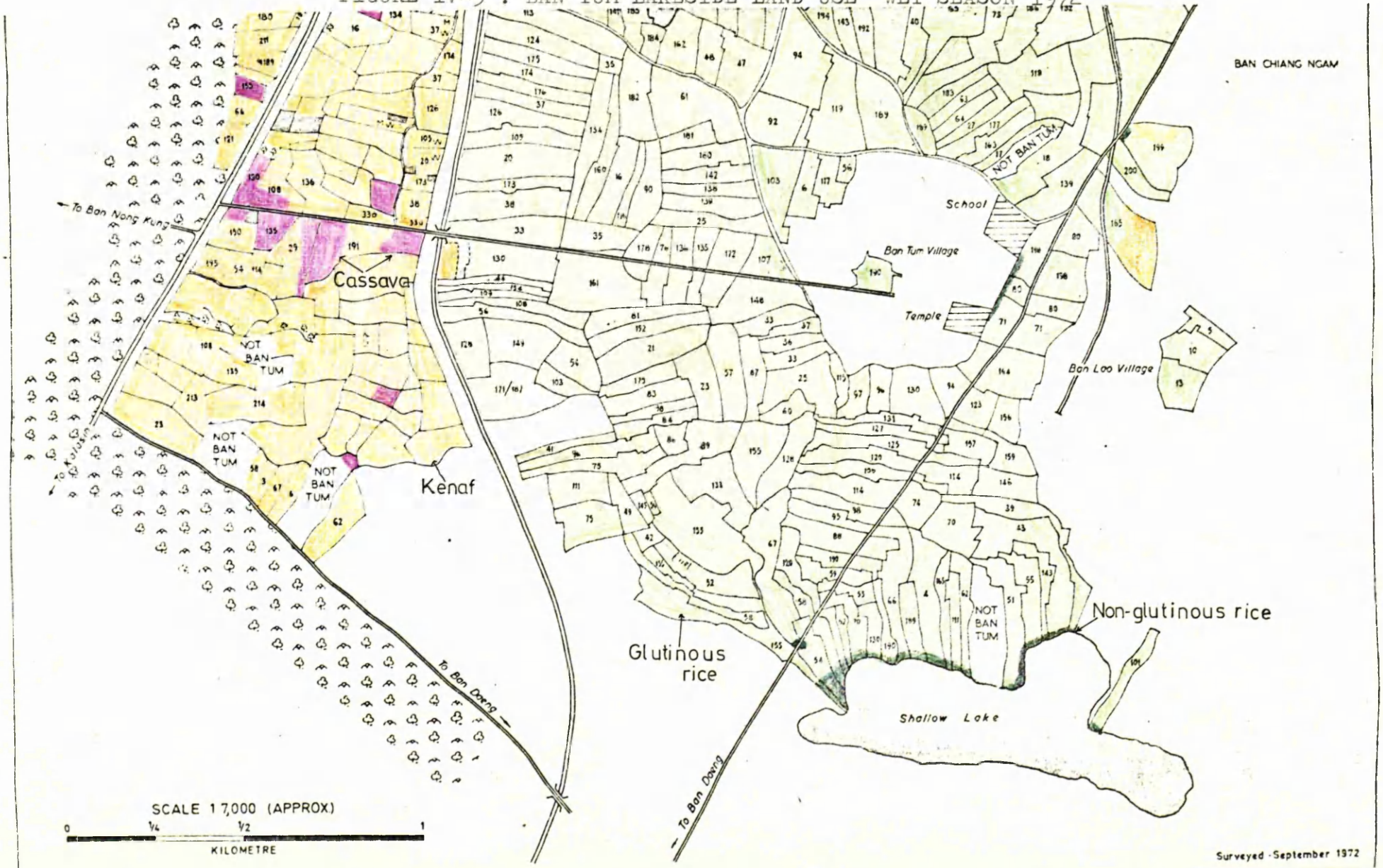
21. Although there are limits to this, as is clear from plot No. 111, Figure IV-2.

FIGURE IV-3 : BAN TUM LAKESIDE LAND USE WET SEASON 1972



land is of a more or less uniform nature, even here marginal differences may be quite important. In Ban Lao Yai, all the village's paddy land is located in the flood plain of the Lam Chi and all is subject, to some degree, to flood danger. However, as Figure IV-4 shows, there is a fall of some 2-3 metres from the village site onto the flood plain and a number of farmers have developed land adjacent to the village here to contrast with their flood plain holdings. Farmer No. 22 was a particularly interesting example. He had accumulated three plots by purchase and by inheritance, one on the sloping land adjacent to the village and two on the lower land of the flood plain. Of these two plots, the farmer noted that one, beside the watercourse, was more susceptible to flood than the other, with a flood problem in three years out of four. This he regarded as something of a bonus to his farm management strategy and had been growing non-glutinous rice for sale on this plot. The other flood plain plot, less liable to inundation, but very flat, he normally planted with the tall-growing variety of glutinous rice, Kamphai-Taichung. The plot adjacent to the village, the most reliable of the three, was, on the other hand, planted with the glutinous variety preferred for consumption, Niaw Sanpatong.

The element which pervades all these different spatial patterns of land holding is the need to ensure family subsistence under conditions of unreliable rainfall. The attitude noted here also has its expression in the system of inheritance which has evolved in the context of traditional agriculture in the Lam Pao project area, which closely resembles that described by other workers in the Northeast. Speaking of the Huay Mong area of the proposed stage 1 development of the Pa

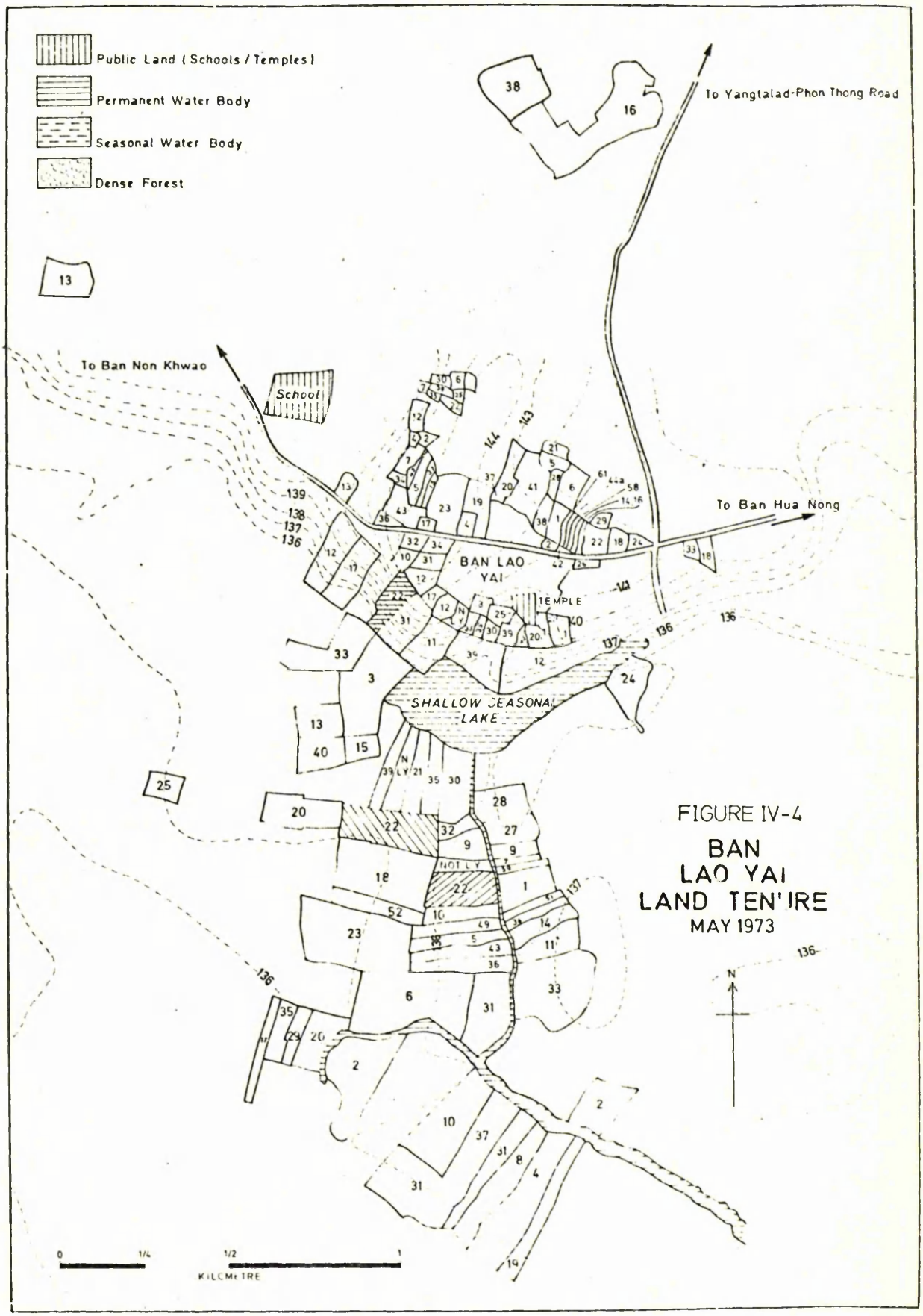


FIGURE IV-4

BAN
LAO YAI
LAND TENURE
MAY 1973

Mong project, Ingersoll sums up the typical situation:

> "Farmers usually prefer to divide land among their daughters leaving sons to acquire land by marriage. In large families, the parents are usually well along in years when the last daughter marries. This daughter, the youngest one, remains at home with her husband looking after her parents in their old age. Having divided the land among their daughters with a plot reserved for themselves, the parents would then pass on their own personal parcel and perhaps the house to the daughter who took care of them." 22

Observations in the Lam Pao irrigation project area suggest that the system of inheritance is somewhat more complex than briefly described by Ingersoll. Nevertheless the basic rationale of the need to ensure the family subsistence livelihood remains. Inheritance in the area is, indeed, mainly via the daughter and son-in-law rather than by the son. This reduces the initial subdivision of the original land parcel and leaves the land in the hands of the otherwise least secure members of the family. Sons, of course, will inherit land on marriage through their wife, but should this inheritance be insufficient for family needs, in a situation where large areas of easily cleared cultivable land have been available, they have been accustomed to cut further land from the forest. This has tended to maintain the average size of holding within the community.

Flexibility, however, is the keynote of the system. Sons do have a right to claim land and indeed do inherit in the absence of daughters in the family. Traditionally, where there have been daughters to be taken care of, sons have tended not to claim a land inheritance. This is not to say that they

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22. Ingersoll,J., "The Social Feasibility of Pa Mong Irrigation. Requirements and Realities" Bangkok 1969, pp.102-103.

necessarily receive nothing. In establishing his own family a male sibling may receive gifts of cash or property from his parents as well as from his in-laws and particularly if his own family is substantially better off than his wife's family, they may feel obliged to assist with a portion of land or a buffalo. Conversely it may be that a particular sibling in the household has established a particularly advantageous position in society. Where this has been due to parental patronage, such as support in further study, the recipient may well not be seen to be entitled to a full share of the inheritance.[23]

The actual process of inheritance is likewise geared to the security of all involved. It should not be assumed that inheritance takes place on the death of either or both of the parents, but rather occurs throughout their lifetime in relation to the marriage and the establishment of separate households by the individual sons and daughters. The speed with which the extended family divides on the marriage of one of its members depends on socio-economic factors. The husband of the new marriage commonly moves to live with the wife's parents and forms an important and integral part of the household labour force,[24] as well as an added security for the extended family. Only after some period of residence will this couple actually form a separate household. The length of this period may depend on the ability of the husband to accumulate some capital of his own to finance the construction of a house or,

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23. For the observations in this and subsequent paragraphs, the writer is indebted to Bowie, Katherine, "An Impressionistic Account of the Possible Effect of Land Inheritance Patterns on Land Holdings in the Lam Pao Project Area," Lam Pao Land Use Working Paper, Bangkok 1975.

24. By the same token, if a wife's family has a copious supply of labour and the husband's is short thereof, then they may live with the husband's parents.

traditionally, on his speed at clearing an independent holding. It may also depend nn the plans of his brothers- and sisters-in-law. If the household has only one daughter, then she and her husband may live permanently in the house of her parents. If there are more daughters, then each may establish a separate household as the next marries and resides in the parental household.

It is clear that the establishment of a separate household in their own house does not mean that a couple at the same time inherit land. The original household head may retain control of the whole family holding for many years, sometimes for as long as he is able to effectively contribute to the working of it, enabling the whole household to benefit from his long experience of paddy cultivation. In this way

> "The older generation is...apt to be in control of farm decisions." 25

Although this authority may be contested by the younger generation, it is less likely that such a challenge will come from the son-in-law than from the son. The son-in-law is in a position of great uncertainty; not only does he not know when he will obtain control over the land, but also, if there are several daughters, he may also not know which part of the holding he will eventually inherit. It may indeed be difficult to make this decision until the future of most of the family is settled.

Usually, after the establishment of their own household, the new family work the land of the extended family for some years before inheriting their own plot. Even then the real degree of control such a family has over its own land is

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25. Ingersoll, op.cit. (1968), p.197.

difficult to ascertain. Deference to the opinion of the household head may continue to be important even after formal control has been given to a son-in-law. In Lam Pao frequent instances of the land title deed being maintained in the name of one of the parents have been recorded.[26]

Ingersoll instances a case where a farmer attempted to dig a ditch to bring water to his fields, then in an acutely dry condition.

> "His father-in-law, the owner of the fields, objected, and that was the end of the matter." [27]

and a particular case interviewed at Ban Fai Taek in Lam Pao also gives some insight into the situation. Here a 29-year old farmer, with a wife and two small children, claimed to own a total holding of 29 rai, 24 rai of paddy and 5 rai of upland. He seemed reluctant to give details about his activities without reference to an older farmer sitting nearby, who turned out to be his father-in-law. After a time, it became apparent that the young man himself only owned the upland and 3 rai of paddy, but that he continued to help work the land of his father-in-law throughout the year.

This example also serves to highlight the difference in attitude prevalent in the Northeast of Thailand towards the paddy-land and upland in a family farm. The rice land is of the utmost importance to the household; decisions over its use remain the prerogative of the household head. Most of the paddy has been developed for some years and the most common manner

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26. The Thai phrase for this situation is descriptive: 'Baeng hay, tae may day own', meaning that the plot had been divided off but the title deed not transferred.

27. Ingersoll, op.cit., (1968), p.197.

of acquisition is by inheritance. Table IV-8 shows the distribution of the method of acquisition of glutinous rice plots in the villages of the Lam Pao sample survey. Although a small proportion of plots have been purchased, in most villages nearly three-quarters of paddy plots have been inherited by their owners. Most farmers have their own plots, but a number, mostly young men, are able to use the plots of relatives or friends without payment. These and most of the cases of renting recorded served as an adjustment of available land resources to those of labour. Those people renting out were families with land and little labour, whether because of age or because of other occupations such as schoolteachers. The renters again tended to be younger families with little land of their own.[28] Rent was normally paid as a 50% share of the total produce and was paid in rice. In cases of crop loss this rent would be adjusted in favour of the person likely to be most badly affected by the loss. It must be noted, however, that the incidence of renting in the area, as recorded in 1970-71, was very small, corresponding to the low proportion of non-owner-cultivators in the Agricultural Census of 1963 (3.5%)[29] and to the 6.5% of tenant farmers recorded by Chamlong in the Nongwai project in 1969.[30]

By contrast much of the upland area, overwhelmingly under kenaf, has been developed only recently following the clearing

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28. But see below.

29. National Statistical Office, (1963), op.cit. Table 1, pp. 12-13.

30. Chamlong Tohtong, "Report on Bench-Mark Socio-Economic Survey of Nong Wai Irrigated Area (Right Main Canal) as of 1968", Mekong Committee, Bangkok 1969, Table 5, p.

TABLE IV - 8

Glutinous Rice: Manner of Acquisition of Plots

Lam Pao Survey Villages 1970-71 & 1971-2

Manner of Acquisition	Purchase		Inheritance		Renting		Free Use		Self-Clearance	
Village	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971
	% of Total Cases									
Ban Na Chuak Nuea	12.2	24.5	79.7	67.9	-	-	17.1	1.9	-	5.7
Ban Tum	16.2	11.6	81.1	86.0	-	-	2.7	2.3	-	-
Ban Um Mao	14.3	5.3	75.5	89.5	-	-	10.2	5.3	-	-
Ban Fai Taek	7.4	4.8	55.6	61.9	3.7	23.8	29.6	9.5	3.7	-
Ban Lek	11.0	6.7	72.6	86.7	-	3.3	15.1	3.3	1.4	-
Ban Non Sung	2.4	10.4	78.6	83.3	2.4	-	16.7	6.3	-	-
Ban Lao Yai	2.3	15.4	97.7	84.6	-	-	-	-	-	-

of forest land. It has been even more recently that this upland has entered into permanent cultivation. Platenius, writing of the Northeast in general in 1963, noted that shifting cultivation of this upland was still quite common[31] and, as was previously mentioned, Vira et al. comment on this feature within the Lam Pao area.[32] Under cultivation for ten years or less, the attitude of farmers towards their kenaf land is fundamentally different from that towards paddy. The upland remains only a supplement to the basic rice economy and the older farmers cannot claim any great expertise in the cultivation of the new crop. Thus the younger farmers, often sons-in-law with no paddy land of their own, are encouraged to develop kenaf land from the forest or to take over the cultivation of the family kenaf holding.

These considerations are reflected in the tenurial status of kenaf plots. Table IV-9, showing the manner of acquisition of kenaf plots, gives a much lower proportion of inherited plots and a much higher incidence of owner-clearance, free-use and purchase. Clearance is most common in the north of the project where substantial areas of forested land still remain, but free-use of plots owned by others is extensive throughout and suggests a lack of commitment by at least some of the farmers in the area. Only in the southern villages are inherited plots dominant, where they may have been used for other crops like peanuts and cotton previously grown on a subsistence basis. Renting of kenaf plots was recorded as rather more frequent than for rice. Usually

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31. Platenius, Hans, "The Northeast of Thailand: its Problems and Potentialities", NEDB, Bangkok 1963, p.7.

32. Vira Poomvises, F.R.Moorman and Sarot Montrakun, "Detailed Reconnaissance Soil Survey of the Lam Pao Irrigation Project" Ministry of National Development, Bangkok 1963, p.4.

TABLE IV - 9

Kenaf: Manner of Acquisition of Plots

Lam Pao Survey Villages 1970-71 & 1971-72

Manner of Acquisition	Purchase		Inheritance		Renting		Free-Use		Self-Clearance	
	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971
	% of Total Cases									
Village										
Ban Na Chuak Nuea	36.4	28.0	45.5	44.0	-	-	9.1	4.0	9.1	24.0
Ban Tum	20.7	25.0	41.1	34.7	-	5.6	6.9	1.4	31.0	33.3
Ban Um Mao	33.3	12.5	33.3	75.0	-	12.5	25.0	-	8.3	-
Ban Fai Taek	20.0	50.0	30.0	37.5	-	-	10.0	12.5	40.0	-
Ban Lek	15.8	21.4	47.4	46.4	15.8	14.3	15.8	14.3	-	3.6
Ban Non Sung	11.8	9.5	73.1	61.9	-	9.5	15.4	9.5	-	9.5
Ban Lao Yai	-	42.9	100.0	51.1	-	-	-	-	-	-

this was a matter of young men wishing to earn an independent cash income, even before they had established separate households and the rent was normally paid in cash. Occasionally, however, 50% share cropping extends to kenaf, the landlord disposing of his share as he requires.[33]

The above discussion has sought to point out the basic characteristics and structural differences in the use of land resources under the traditional rain-fed agriculture carried out in the Lam Pao project area. Paddy land is clearly the most important element of the traditional land holding pattern. The relative value of different paddy plots is judged according to the reliability of production rather than on their inherent fertility. Where land has not been in short supply, farmers have sought to cultivate larger areas of different land types to compensate for the expected crop loss from drought or flood. The paddy land is so important to the farm family that the household head is reluctant to give up control over decisions regarding it until all his family have been duly settled in their own viable households. This attitude contrasts strongly with that towards the upland, where the younger members of a family are allowed and even encouraged to develop separate holdings.

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33. It should be noted that the availability of kenaf lands for renting has been growing as, particularly in Bam Tum, the yields have begun to decline and fewer farmers have found it worthwhile to cultivate. Seven cases of renting of kenaf land were recorded in that village alone in 1972-3, with a standard rent being charged of 100 baht per rai, although, as with rice, this rent may be reduced if it holds no profit for the renter. The presence of fallow lands two years later, however, suggests that the attraction of renting kenaf lands is no longer very great.

This pattern of land tenure must be reviewed with the onset of irrigated agriculture. If a premium is to be put on the most reliable paddy land, then it will probably emphasise land which has the most reliable, best-controlled water supply. If the greater part of a village's land is to be irrigated or provided with drainage facilities and is assured of a reliable water supply at all times, then it may be that the advantage will lie with those areas of high innate fertility - which may once have been the least reliable land. On the other hand, it may be supposed that the owners of these plots may be anxious to acquire the better land inside the irrigated area. Further, those farmers who were content to work upland plots for a cash income while they waited to inherit family holdings may wish, under the new opportunities provided by irrigation water, to have a greater say in the use of the irrigated land. It is likely that such younger farmers may be more responsive to these new opportunities; indeed, it has been suggested that training in the technique of irrigated agriculture should be aimed particularly at these groups.[34] Whatever the outcome of such proposals, it is probable that the need to re-assess the relative value of land resources with irrigation will be one of the constraints on its adoption.

In the Lam Pao project area, irrigation water had only reached a limited area by the dry season of 1972-73. Initial steps were made in 1969 when water was transmitted to Ban Na Chuak Nuea and Ban Roeng Thom, both close to the Right Main

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34. Pilgrim,J.W., "Proposals for the Organisational Basis of Agricultural Extension and Training in the Lam Pao Project Area", Bangkok 1970, mimeo. See also below, Chapter VIII.

Canal and less than seven kilometres from the dam site in the case of Ban Roeng Thom. The following year, the turnout problems at Ban Na Chuak Tay were also solved and water began to be sent further south along a minor lateral (1L1) to the demonstration plot developed at Ban Lao- Ban Tum. A major lateral (1L) was also completed, branching off the main canal at Ban Pho Si and leading to a group of villages, Ban Wang Yung, Ban Kut Or and Ban Fai Taek, across the Lam Phan river. A branch of this (1L-1R), close to the left bank of the Lam Phan, serves another group, including Ban Tha Saeng, Ban Tha Sida and Ban Dong Muang. Unfortunately slow progress has been made in sending water to the 1L system due to budgetry difficulties and maintenance work and supplies only arrived at Ban Fai Taek in the wet season of 1972. Further problems have been encountered on the right main canal in the meantime and here water was not flowing further south than the Ban Lao lateral. Figure III-2 shows the extent of irrigation development at the present time.[35]

Of the sample villages in the Lam Pao land use survey, therefore, only three have been supplied with water at any stage at the present time and Ban Tum's supply has been rather irregular. Ban Fai Taek, moreover, has only received water for two seasons, so that, as a consequence, the effect of the receipt of irrigation water on the land holding pattern in the Lam Pao area can only be fully judged from Ban Na Chuak Nuea. Nevertheless, as will be seen, the anticipation of the arrival

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35. By early 1975, water could be transmitted in the Right Main Canal as far as Ban Kham Maet and Ban Khok Yai, the 1L system was supplying the group of villages dominated by Ban Khok Kong and Ban Chiang Ngam and the Left Main Canal was also operational in the area of Ban Nong So. See also Figure III-IV.

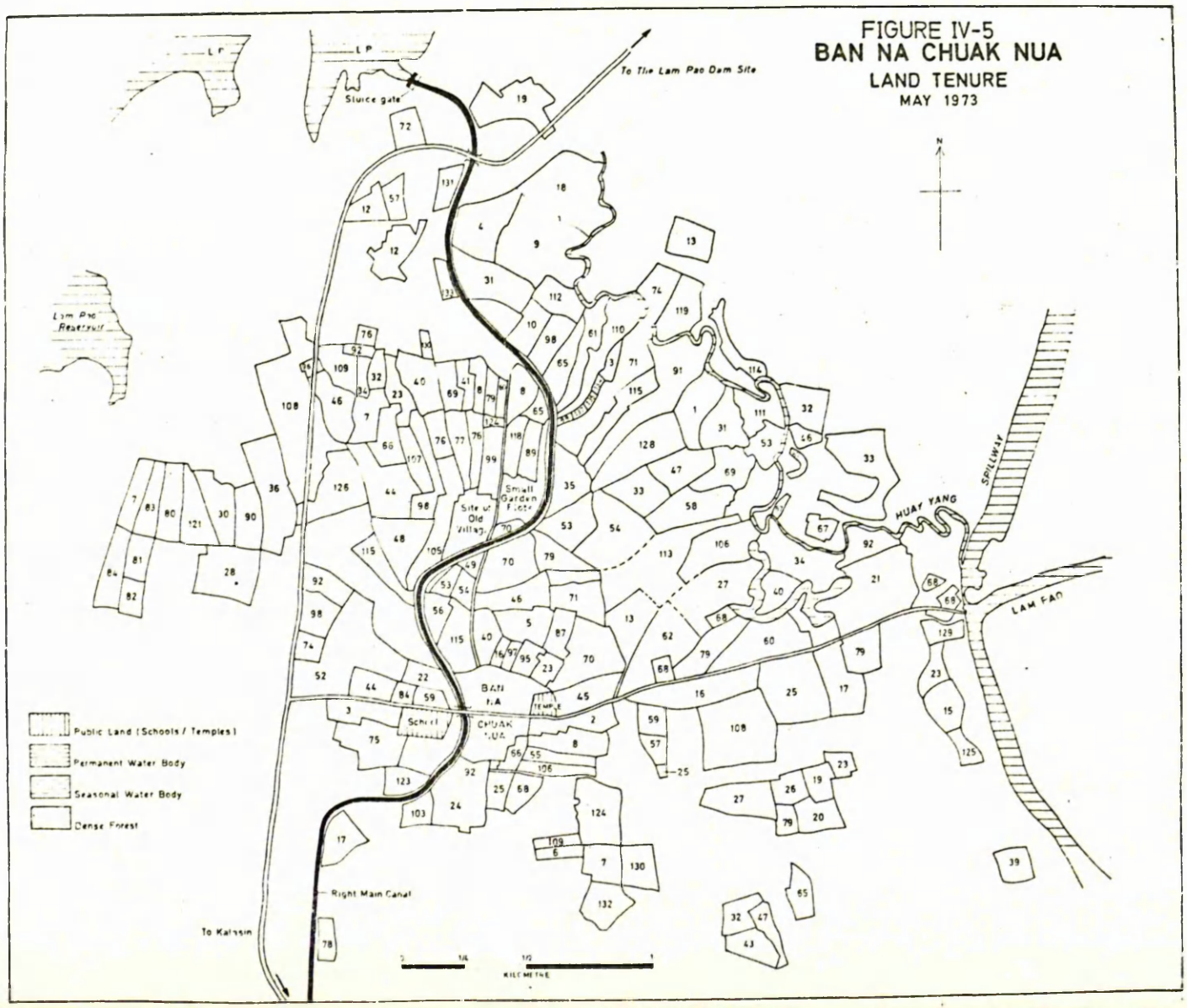
FIGURE IV-5
BAN NA CHUAK NUA
LAND TENURE
MAY 1973
N
To The Lam Pao Dam Site
Sluice gate
Lam Pao Reservoir
Small Garden Plots
Site of Old Village
BAN NA CHUAK NUA
TEMPLE
School
HUAY YANG
SPILLWAY
LAM PAO
Right Main Canal
To Kalasin
Public Land (Schools / Temples)
Permanent Water Body
Seasonal Water Body
Dense Forest
KILOMETRE

of water may be a factor in the two other villages, notably in Ban Fai Taek.

In Ban Na Chuak Nuea, even after some four-five years of irrigation water supply, it is possible to recognise certain changes in the organisation of the village's land resources. Although the fact that Ban Na Chuak Nuea is a relatively recent foundation and this tends to make judgment of the effects of irrigation more difficult, increased clearance activity, changes in attitudes towards land resources and actual transfers of land ownership may all be seen in the context of the arrival of irrigation.

Figure IV-5 shows the present pattern of land tenure in Ban Na Chuak Nuea. Development of land in this village is still being undertaken and the holding pattern still evolving. Clearance of forest is taking place for the development of both paddy and upland, but whereas upland is to be found throughout the village, clearance for paddy is being carried out almost exclusively within the irrigible area. If the 1972 land use pattern in the village is compared to that existing at the time when the latest available aerial photographs of the area were flown in the dry season of 1968, it will be seen that substantial areas of forested land have been cleared within the irrigation area, particularly along the line of the major farm ditches, in the intervening four years.[36] (Plate IV-1 and Figure IV-6). The aerial photographs were taken before the construction of the farm ditches had been carried out, but it is clear that their approximate alignment was widely known.

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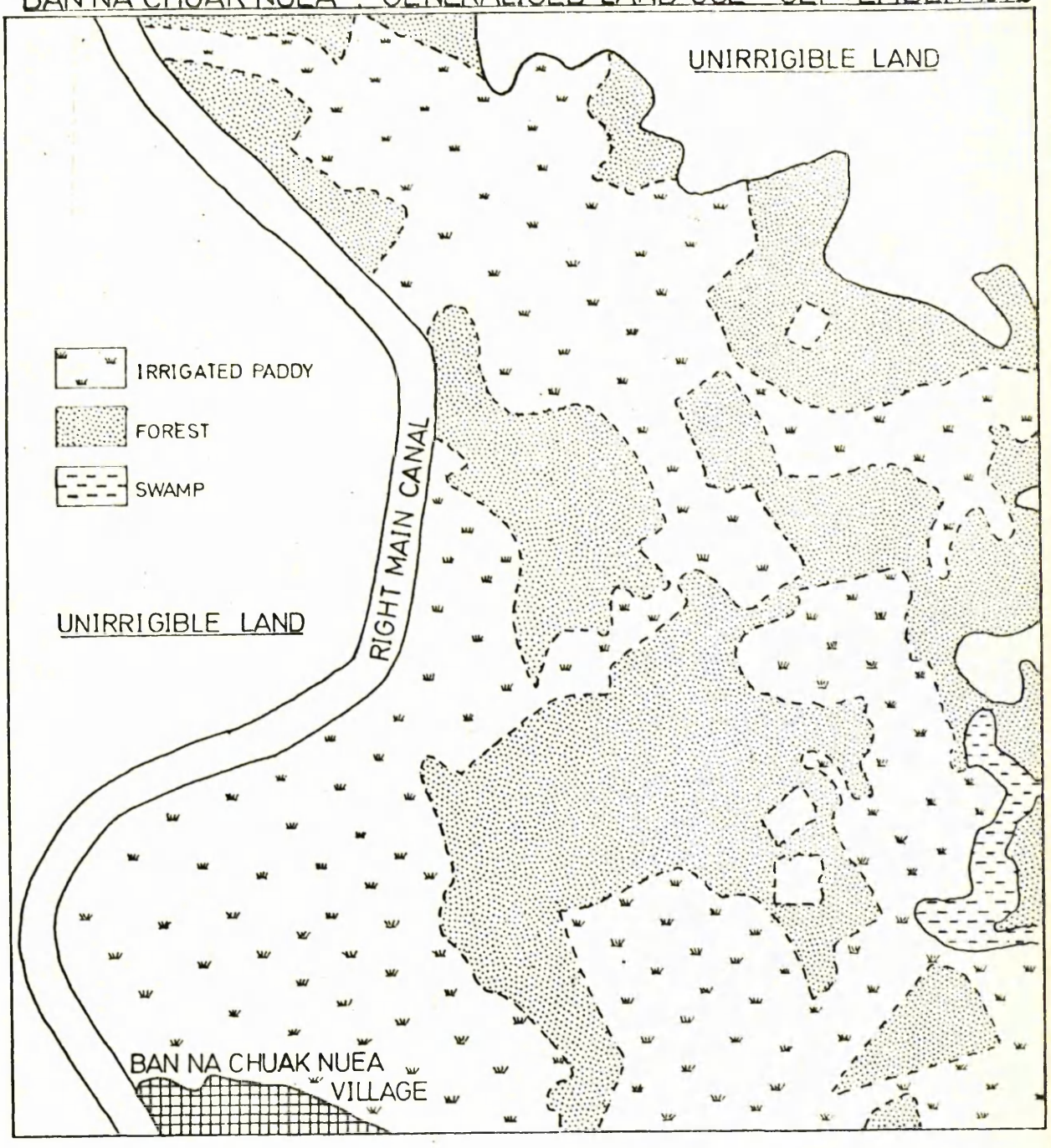
36. Even more recent aerial photographs, taken in 1974, show even more extensive clearance in this area.

FIGURE IV-6

BAN NA CHUAK NUEA : GENERALISED LAND USE SEPTEMBER 1972



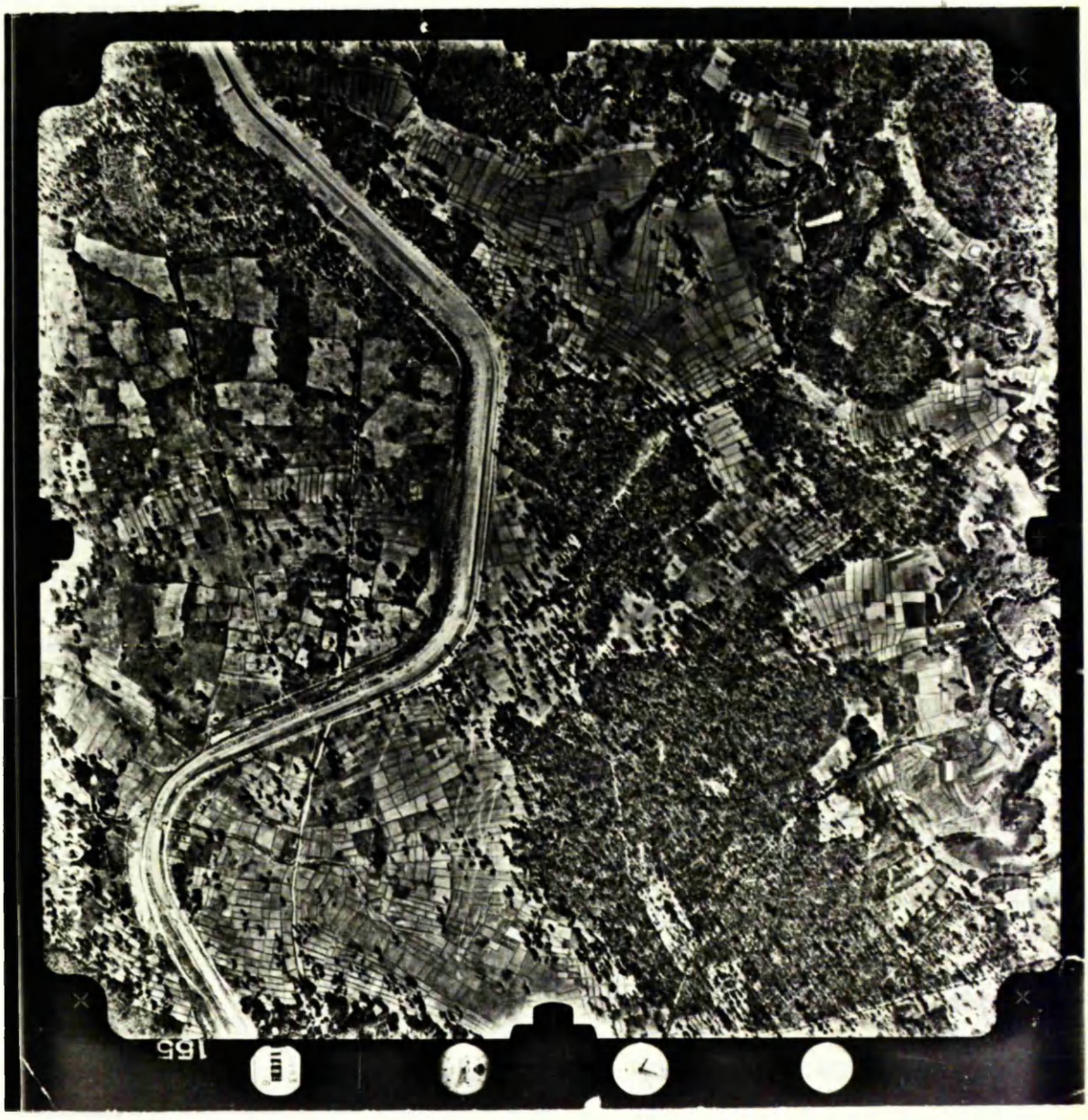


PLATE IV-1 Ban Na Chuak Nuea, The Irrigated Area. This lies between the canal and the Huay Yang. The extent of the forested area in this section of the photograph may be compared directly with Figure IV-6, which covers the same area in 1972. The photograph was taken in 1969.

This was certainly the case with the owner of plot No. 108 on Figure IV-5. This farmer realised that his existing plot, some 30 rai of higher land to the north-west of the village and outside the scope of the irrigation system, could not be served with water. He therefore purchased an area of forested land within the irrigable area from a relative some eleven years ago, financing the purchase mainly out of his earnings as a guard at the dam site. Since that time he has slowly cleared the plot - the aerial photograph of 1968 shows it with the southern part cleared - and was appointed common irrigator for the land served by the turnout on which his land was located. (Turnout 3). Although he had to wait until 1971 for the completion of the ditch to his plot, his intention was to concentrate his paddy production on the irrigated land and to rent out the plot outside the irrigation system.[37]

This particular farmer is continuing to clear upland near his old rice plot for kenaf and cassava cultivation and has become one of the major land owners in the village.[38] Indeed, it would appear to be the larger, richer landowners who have undertaken most of the new clearance within the irrigation project. Although there are households like No. 112 who, in establishing a separate home, have developed their own paddy land from forest, these cases are rare. On the other hand, large landowners like farmers Nos. 13, 62 and 79 have acquired

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37. Ingersoll,(1968), op.cit. has it: "Following the introduction of irrigation..farmers are likely to concentrate on the irrigated area...they will ignore the less productive higher plots which they have cultivated in the past." (pp.56-7).

38. In early 1975, following the death of the village head-teacher in a car accident, this farmer had purchased his holding of 20 rai of irrigible land.

and cleared large areas of forest within the project area. In 1971 farmer No. 79 had just purchased a third paddy plot in the irrigated area; at that stage he had cleared only two rai, but as the land-use map shows (Figure IV-6), by September 1972 he had pushed back the forest yet further.

The importance of having the initial capital to take advantage of the new facilities is highlighted by the case of another farmer whose initial position was not dissimilar from that of the Common Irrigator above. The man (No.77) owned a single paddy plot of 9.5 rai with an adjacent 5 rai of upland, both outside the irrigible area. The paddy land is high and the soil poor, so that the total yield of 1500 kilogrammes obtained in 1971-72 was scarcely sufficient to feed his family of seven. With the arrival of irrigation, this farmer had been unable to purchase even a small plot in the irrigation area. The farmer was well aware of his disadvantageous position and was anxious to receive advice on how to improve it. He had thought of pumping water from the Right Main Canal, but the distance and the slope of the land prevented this. He was unwilling to borrow capital from relatives or from a co-operative for fear of falling into serious debt. The return from his kenaf was required for family consumption. It seemed likely that he was destined to remain one of the village's 'have-nots'.

Given the availability of land in Ban Na Chuak Nuea, the farmer mentioned above should theoretically be in a position to buy land within the irrigation area or, at less substantial capital outlay, to rent a plot. It is clear, moreover, that plots are continuing to change hands within the irrigation area. In 1971-72, farmer No. 53, with an excess of riches in

the shape of three large plots within the irrigible area, had sold off part of the plot furthest from the main farm ditch to farmer No. 69. Moreover a large plot owned by farmer No. 115, who apparently lacked labour to work it, had been rented out to people from both inside and outside the village. Unfortunately neither the price of sale nor the rent paid for the use of these pieces of land could be established, but it seems clear that land prices are increasing rapidly and purchase of land may soon be beyond the scope of more than a minority of farmers. Renting too promises to be more expensive and insecure.

Evidence of land price rises is available from other irrigation projects. At the Huay Sithon farm, values of irrigated land are held to be as high as 10,000 baht per rai[39] and at Nongwai, Ingersoll has recorded a steady inflation of prices:

> "Land in the area of the Nam Pong reservoir normally cost about 1000 baht per rai before the construction of the dam...(but) Prices for rice land appear already to have begun rising in the irrigation area. Although some villagers told us that land had recently cost about 1000 baht per rai, the 60 farmers surveyed gave an average figure over 2500 baht per rai for land similar in quality to their own." 40

In Lam Pao the evidence is somewhat limited, but the indications are clear. Evidence of the typical price of non-irrigible land may be drawn from Ban Na Chuak Nuea, where a plot of 10 rai of paddy was purchased in 1971-72 for 15,800 baht. By 1974-5 the upward trend may be seen from evidence in the same village. One farmer (No. 61), preparing to migrate elsewhere, disposed of his 18 rai irrigible holding for

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39. Ng, (1972), op.cit., Volume 1, p.12.

40. Ingersoll, (1968), op.cit., pp.125-6.

40,000 baht (2,222 baht per rai). A similar figure was recorded in Ban Tum where 9 rai of irrigible paddy changed hands at 2,778 baht per rai. Even in Ban Um Mao, still without irrigation, a plot changed hands for an average of 2,000 baht per rai, compared to what the headman described as a typical price of 1200-1300 baht per rai only a couple of years before. These prices, however, in no way compared with a particularly well-served plot in Ban Tum. Here, the 'kamnan', returning to farming after a period as a pick-up bus owner, secured a plot of just 8 rai straddled by the road entering the village for a massive 50,000 baht (6250 baht per rai).

If the increasing land prices are making the acquisition of land inside the irrigation area more difficult, then the desire to rent land in the area also seems to be growing. This is the case in the low terrace villages where pressure on the land is greatest and in Ban Fai Taek particularly the problems of families without land or with only minute holdings may be seen in increased renting and in higher levels of rent. By crop season 1971-72, renting in these villages was growing as increased subdivisions of existing holdings produced land shortages in some families. In Ban Fai Taek 6 farmers were involved in renting agreements out of a total sample of 23 farmers, two of whom only owned small plots of bananas and were engaged mainly in off-farm work. Of these five farmers were renting-in land, while there was one case of a household dependent largely on off-farm labour renting out its holding. As can be seen from Table IV-10, the extent of renting recorded in 1971-2 could not be put down to sampling error and in the following year in Ban Fai Taek 8 cases were discovered out of 31 samples, although one of the agreements was duplicated by the

TABLE IV - 10

Ban Fai Taek: Land Renting Agreements

Year	Household No.	Area Rented In	Area Rented Out	Share Crop %	Rice Equivalent (Kgs)	Total Value (Baht)	Value Per Rai (Baht) Current Price	Value Per Rai (Baht) Constant 1970-71 Price
1970-71	4011	8		50	1500	2415	301.9	301.9
	4033	2				200	100.0	100.0
	4034		7	50	1500	1765	109.3	109.3
	4043	12		50	3000	1530	127.5	127.5
	4047	7		50	1500	765	109.3	109.3
	4050		6	50	550	281	46.8	46.8
1971-72	4007		12	50	2600	1664	138.7	110.5
	4011	8		50	3000	1920	240.0	191.8
	4031	13					73.0	58.2
	4037	10		50	1000	640	64.0	51.0
	4043	45		50	5000	3200	71.1	56.7
1972-73	4007		20	50	2500	3075	153.8	63.8
	4008		7	50	2500	3075	439.3	182.1
	4011	4		50	1350	1661	415.2	172.1
	4023	16	8	50	3000	3690	230.6	95.6
	4030	10		50	2700	3321	332.1	137.7
	4035		4	50	1000	1230	307.5	127.5
	4042		30	50	5000	6150	205.0	85.0
	4043	5				1000	200.0	82.9
	4055	4		50	1000	1230	307.5	127.5
	4071		3	50	600	738	246.0	101.7
	4081		4	50	1350	1661	415.2	172.1
	4095		10	50	2700	3321	332.1	137.7

inclusion of both renter and landlord. In this year a majority of cases of renting out were caught in the sample, but since each of these was renting to another farmer in Ban Fai Taek, the extent of the phenomenon may be confirmed. Moreover, by 1972-73, in other villages of higher population density an increased incidence of renting was recorded. In Ban Tum, 6 cases of more established farmers with other interests - village shopkeeper, pick-up owner and two teachers - were renting out to younger farmers in the village, some of whom had yet to establish their own separate household. In Ban Lek and Ban Lao Yai renting had also increased over previous years, in the latter case the renting being a harbinger of the later mass migration from that village.

According to Ingersoll,

> "The renting in and out of some of their (farmers') land appears to be a matter not so much of poverty but of labour currently available to cultivate rice." 41

While this continues to be true in many of the cases noted above, it is clear that in Ban Fai Taek particularly there are beginning to emerge some of the less advantageous aspects of the renting system. Despite an element of social welfare inherent in the system as traditionally operated, the tenant farmer at present is in an insecure position. He has no incentive to make any improvements on the land he is cultivating, being unable to rely on the use of it in successive seasons, and under share-cropping agreements he receives only half of any increase in production he may bring about. In Ban Fai Taek such share-cropping agreements now seem to be operating more rigidly than previously when the

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41. Ingersoll, (1968), op.cit., p.129.

agreement could be modified to give each party according to his need. Farmer No. 11, for example, renting in two successive years from the village headmaster, failed in each to obtain enough rice for subsistence after the teacher had taken his standard 50% share. With the heavy demand for land, however, he had little choice but to pay the rent.

This farmer was fortunate in that he was able to rent from the same source in both 1971-72 and 1972-73, albeit over a smaller area in the second year. Other families are in the unenviable position of having to find land anew each year. Farmer No. 43 in Ban Fai Taek, latterly one of the village headman's assistant, may be taken as an example. In 1970-71 he had managed to rent an adequate 12 rai on a 50% share-crop basis; in the following year a large plot owned by a major landowner in another village came available and the headman's assistant was able to rent 45 rai of irrigable land, although not then receiving water. He had been able to sell some of his 5000 kilogramme share of the crop and was satisfied with the arrangement. Unfortunately in the following year, 1972-73, he was unable to continue the agreement; on receipt of irrigation water, the owner wished to work the plot for himself. The farmer therefore had managed to acquire only a small plot of 5 rai to rent for that season, land which was to cost him a cash rent of 200 baht per rai and which was some distance from Ban Fai Taek. He was wishing not to have sold rice in the previous year, for his production looked barely sufficient for family consumption needs.

Nor is this unpredictable availability of land confined to Ban Fai Taek. In Ban Tum too the phenomenon is growing

as the attraction of irrigated land increases. Large landowners can disturb the plans of those without land of their own. One shop-keeper in the village had been content to allow a young farmer to crop his 22.5 rai in 1972-73, but the prospects of irrigation and better crop prices in 1973-74 had led him to cancel the agreement for the following season. Again the enterprising 'kamnan', having apparently seen agriculture as a minor occupation for two or three years previously, to the extent of selling upland, buying a pick-up bus and renting his land out to a young farmer in the village on a share-crop agreement, suddenly decided in the dry season of 1974, on receipt of irrigation water, to buy two new buffaloes and a new metal ploughstock, proceeded to grow a dry-season rice crop and seems likely to devote his energies to farming once more.

That rents are increasing seems less certain. In that rents for paddy land are generally calculated in kind (75% of all cases recorded in three years), the actual value of the rent increases with the increasing price of rice. If rents are calculated in constant price terms, taking 1971-72 as a base, for Ban Fai Taek, where sufficient cases are present in all three years to allow comparison, the average rent in 1972-73 at 136 baht per rai was no higher than that in 1970-71 at 131 baht per rai. Where the pressure of population on land is growing and the premium of having land inside the irrigation area increasing, however, the costs of renting may be higher than elsewhere. Certainly in Ban Fai Taek and in Ban Tum rent levels have increased beyond the nominal levels still being charged in some of the villages not yet experiencing

population pressure.[42] In Ban Fai Taek by 1972-73 rent levels of 250 baht per rai were to be found (at the price level of the previous year). Even in Ban Tum rents of 140 baht and 130 baht were recorded.

Where land is in short supply and the presence of irrigation water makes the holding of land inside the irrigated area an advantage, it seems certain that instability is going to arise in the traditional land holding pattern in the irrigation project areas of Northeast Thailand. A premium is sure to be given to those farmers with large holdings in the irrigated area. If they cannot work all their holding themselves, then it is to their advantage to rent part out to others for the best return available. They may not rent to the same farmer in subsequent years, putting the renters in a state of insecurity. Renting-out in this way will, moreover, work against the improvement of land, the maintenance of bunds and irrigation ditches and the application of fertilisers; a tenant is unlikely to make such investments if he is unsure that he will benefit from them. Neither will such a landlord contribute to increased diversification. By renting out small areas to subsistent farmers, he will not be putting his own surplus area to work with other crops.

It may be noted, moreover, that the pressure to hold land within the irrigated area is likely to increase steadily in the next few years. As was noted above, to date the inheritance of land in the Northeast region has been mainly

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42. Nominal rents may be characterised as the 8 baht and 22 baht per rai charged in Ban Non Sung and a 33.3% share-cropping agreement made in Ban Na Chuak Nuea in 1970-71 which amounted to a cash equivalent of 10.6 baht per rai.

through the daughters on the assumption that if the sons of the family did not marry into land, they would be able to clear and develop some for themselves. At present the supply of forested land able to be cleared for paddy is very limited in the lowland areas of Northeast Thailand as a whole. In the Lam Pao lowlands, it is likely that a land shortage will soon be developing even in villages with larger land resources. Already in Ban Tum there are examples of subdivision of holdings in which sons are claiming their share of land inheritance in the absence of sufficient land from their wife's family or of land available from the forest.

The development of the irrigation system at Lam Pao is only in its initial stages. Experience of other locations in the Northeast of Thailand suggests that the potential instability of land holdings which has been proposed for Lam Pao may be compounded by other patterns of land transfer as irrigation water is extended to wider areas on a more reliable basis. At the Lam Phra Phlerng irrigation project in Nakorn Ratchasima province, farmers have been receiving a consistent supply of irrigation water in the wet season for some six years and in the dry season for three or four years. There too farmers have made efforts to take advantage of the benefits of irrigible land. Many farmers in the long-settled parts of the Lam Phra Phlerng project area whose land could not be reached by the irrigation water or sons with no inheritance in these densely populated lowlands have sought to develop land in the formerly forested upper reaches for paddy cultivation. Thus the area of paddy land in Zone 1 of the Lam Phra Phlerng project has increased from nothing in 1966 before irrigation began to 10,400 rai

in the 1972 crop season.[43] This development has not only put pressure on the available water supply for the lower zones of the project, but it also illustrates the premium which farmers place on working land within the irrigated area.

This is further highlighted at Lam Phra Phlerng by an increase in the amount of renting of land within the irrigated area as farmers outside the project have sought to obtain land inside. Yet, these wet season renting agreements do not match the even larger transfer of land which has taken place in the dry season as dry season cropping has been introduced. According to an I.B.R.D. sample survey conducted in May 1973, 17% of farmers engaged in second cropping were cultivating other farmers' land.[44] Most of these cases were using the land free of charge, largely because with dry season cropping in its infancy the owner of the land did not know what to charge. In addition, farmers not wishing to plant a second crop were encouraged by the local extension officers to allow free-use of their land by others.

At a later date, such a development has become notable in the Lam Pao project. In 1974-75 a supplementary survey specific to second cropping was carried out in Ban Na Chuak Nuea and three other villages in which second cropping had developed to some considerable extent, Ban Chiang Ngam, Ban Kham Maet and Ban Dong Muang. Here again a significant transfer of land was taking place. In Ban Kham Maet this was

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43. Information from the Royal Irrigation Department, Lam Phra Phlerng Project Office.

44. Ng, R.C.Y., H.Demaine and C.J.Dixon, "A Report on the Introduction of Dry Season Cropping in the Lam Phra Phlerng Irrigation Project Area", Field Report for I.B.R.D., London 1973, mimeo.

of no great significance, involving a few within-family transfers, but in the three other villages the proportion of farmers not using their own land was much higher. In Ban Dong Muang, the percentage was 40.3% and another 5 farmers interviewed were allowing others to use part of their holding. In Ban Chiang Ngam as many as 48.5% were using other farmers' lands and in Ban Na Chuak Nuea the proportion was a remarkable 64.3%.

The high proportion of land transfer in the latter two villages may be interpreted in terms of the relative inefficiency of the irrigation supply at the tertiary level. At Ban Na Chuak Nuea the second cropping was generally concentrated on the relatively well-served holdings of farmers nos. 13, 46, 62 and 79. (See Figure IV-7). At Ban Chiang Ngam, two farmers (Nos. 93 and 78) were the chief benefactors to their neighbours. In each case problems of water supply were important in accounting for this concentration, but another consideration in Ban Na Chuak Nuea was the difficulty of marketing if plots were widely scattered away from vehicular access. Nevertheless, the desire of many farmers with no irrigated land to take part in second cropping was crucial to the transfer of land, especially in Ban Dong Muang where water supply to the village lands was relatively good. In general the land was used rent-free, the owners saying that they benefited both spiritually through merit-making and economically from the effect of dry season fertiliser application on the wet season paddy crop.

It may be argued that this tendency is an expression of the relative novelty of dry season cropping in both Lam Pao and Lam Phra Phlerng. At Lam Phra Phlerng, as at Lam Pao

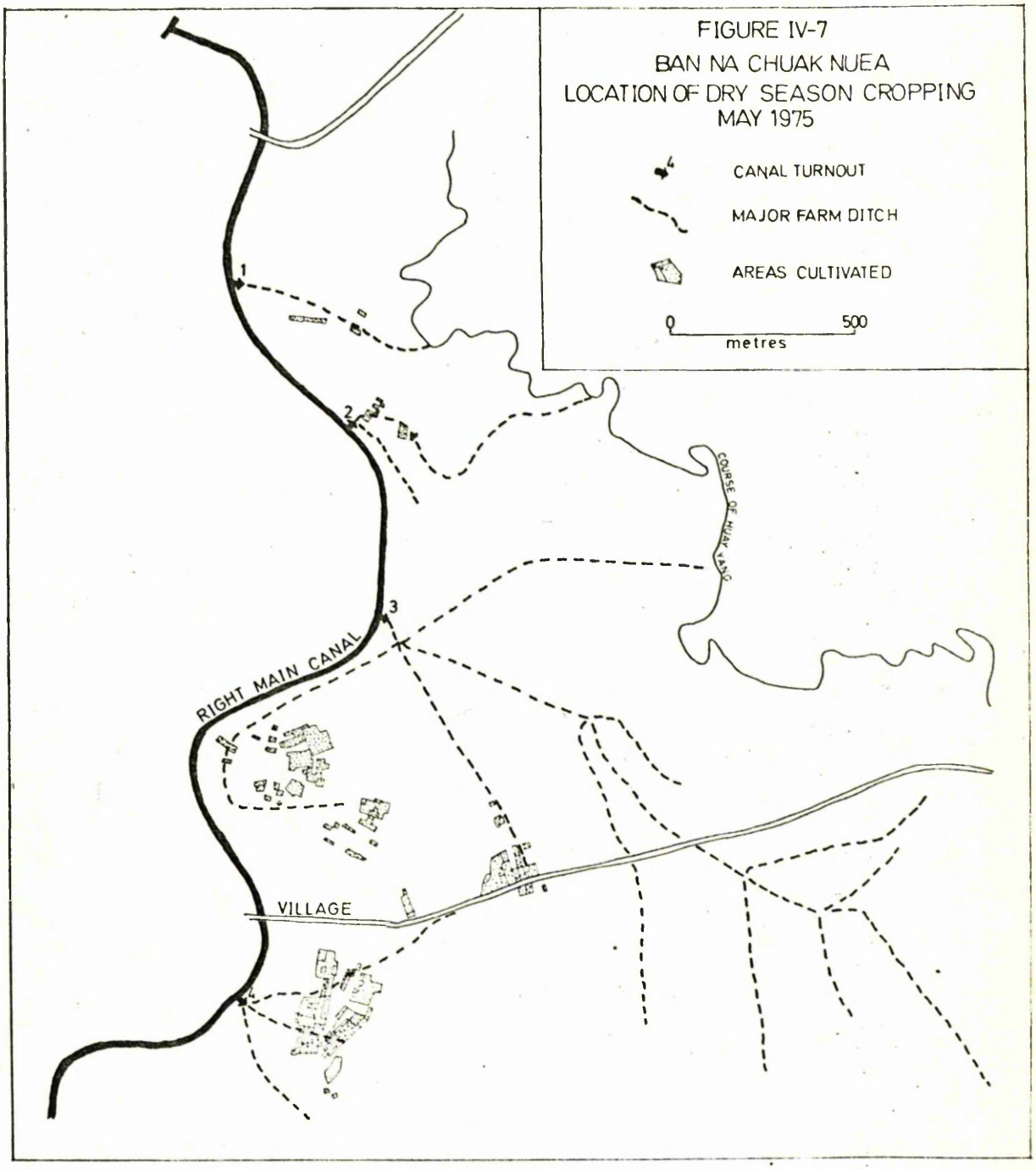
FIGURE IV-7
BAN NA CHUAK NUEA
LOCATION OF DRY SEASON CROPPING
MAY 1975
CANAL TURNOUT
MAJOR FARM DITCH
AREAS CULTIVATED
0
500
metres
1
2
3
4
COURSE OF HUAY YANG
RIGHT MAIN CANAL
VILLAGE

irrigation water in the dry season cannot be sent to all farm ditches even in the upper zones of the project, so that farmers who have desired to cultivate a dry season crop have been encouraged to cultivate land of non-croppers in areas which could be supplied. Moreover many farmers in both projects have adopted a cautious attitude towards second cropping, particularly of new crops, preferring to let others try it out on their land before investing themselves. At Lam Phra Phlerng, many such farmers, viewing the apparent success of the new enterprise, expressed their desire to reclaim their own land for the following season.[45] Thus it may be said that the trend in renting will gradually disappear.

On the other hand, part of the transfer of land in Lam Phra Phlerng was the result not of farmers not being able to receive irrigation water, but that of some farmers wanting to cultivate crops different from those of their immediate neighbours. The two main crops being grown in the dry season of 1973 in the Lam Phra Phlerng project area were the new, short-stem, rapid maturing non-glutinous rice, R.D.1.,[46] and peanuts. These two crops require different amounts of irrigation water and it was clearly impractical for them to be grown on adjacent plots. Extension effort was therefore concentrated in blocks, with farmers being informed which of these blocks were to be set aside for rice and which for peanuts. If a farmer holding land in a

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45. Ng et al., op.cit., p.54.

46. R.D. stands for Rice Department, which has inaugurated a number of new varieties, R.D.1 and R.D.3 being non-glutinous and R.D.2 being glutinous.

rice area desired to grow peanuts, he would be assisted by the local irrigation officers to find land in a peanut block.

Although it is clear that the case of rice and dry-foot crops being grown in close proximity is an extreme example, the question of water requirements for different crops is pertinent to any discussion of the possible effects of irrigation development on the land holding pattern of Northeast Thailand. If the farmers at Lam Phra Phlerng, or indeed Lam Pao, are to be allowed to choose their type of second crop, then such a re-organisation may well be a constant problem. Even where farmers are faced with a choice between different upland crops, the water requirements can be quite different for the various types. In a recent report irrigation water requirements for various crops at different times of the year have been estimated on the basis of effective rainfall and rates of seepage and evaporation for both the Lam Phra Phlerng[47] and the Lam Pao[48] irrigation projects. Their estimates for the Lam Pao project are presented in Table IV-11.

The figures demonstrate that, although planting rice with dry-foot crops is much the largest problem in this respect, other combinations of crops do conflict in their water requirements. Perhaps the case of cotton in combination with sugar cane is the most obvious clash, but other possible conflicts might also arise, and indeed do, if observations in

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47. Engineering Consultants Inc., "Lam Phra Phlerng Irrigation Project Land Classification", 2 Volumes, Royal Irrigation Department, Bangkok 1971.

48. Engineering Consultants Inc., "Lam Pao Irrigation Project Land Classification", (2 Volumes), Royal Irrigation Department, Bangkok 1972.

TABLE IV - 11

Estimated Average Monthly Field Water Requirements By Irrigation for Selected Crops (Physically Optimum Conditions for Irrigation) Lam Pao Project

Month / Crop	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	(Millimetres)											
Rice	140	180	245	225	115	85	90	50	-	125	175	140
Maize	95	130	185	165	60	40	40	15	-	75	125	95
Peanut	90	120	170	150	45	25	35	10	-	65	115	90
Soyabean	85	110	155	135	30	15	20	-	-	50	110	80
Mung) Sorghum)	90	120	170	150	45	25	35	10	-	65	115	90
Cotton	75	100	145	105	20	5	10	-	-	45	110	75
Sugar Cane	105	145	210	190	85	65	70	35	-	95	140	105
Small Vegets	90	120	175	155	60	40	45	25	-	70	115	90

Source: Engineering Consultants Inc: Lamp Pao Irrigation Project
Land Classification
Volume 1, Table VIII-2, p. VIII-10

irrigation projects like Lam Phra Phlerng and Nongwai are any guide. In the former area in 1972, farmers complained that their soyabean had been flooded out by over-irrigation; in the Nongwai project at Khonkaen in the following year, there were indications of over-irrigation of peanuts in fields adjacent to maize crops. Such problems are emphasised where, as is often the case, fields may not be adequately levelled.

It may be supposed that the problems of land re-organisation which are already being experienced at Lam Phra Phlerng in this regard will also affect the Lam Pao irrigation project in the next few years. The problems of second cropping seem destined to further complicate the already existing pressures being felt within the traditional land holding pattern in the area.

In Lam Pao, although the area served by irrigation water is still limited, some of the likely changes are beginning to be observable. The advantage of owning irrigible land within the project area and the increasing difficulty of finding developable land outside is putting pressure on the traditional assumptions within the system of inheritance. The presence of irrigation water is beginning to affect the old assessments of land values in which the premium was placed on ensuring the subsistence crop by holding a variety of land types. Both trends are likely to bring about a re-organisation of the present land tenure pattern even ignoring the effects of water requirements for different crop types.

The need for such a re-organisation may well benefit the farmers with the larger holdings. Those that own large amounts of land within the irrigation project will find their positions enhanced by the new opportunities; those richer

farmers with holdings outside the project are most capable of buying into the project and off-setting their former disadvantage. By contrast smaller farmers outside the irrigable area are unlikely to be able to purchase land, unless through accumulation of capital from other enterprises, and may be forced to seek land to rent if they desire to make use of the new opportunities. Such tenancy agreements can be unstable and can leave the tenant no better off. The farmers with irrigable land, big and small alike, will increasingly be forced to subdivide their holdings into yet smaller parcels. For the smaller holdings, these parcels may be reduced rapidly below the size for adequate subsistence. It may be argued that this trend will, of itself, bring about an increase in the intensity of cultivation, but it may equally lead to indebtedness and landlessness.

Given these conclusions, the arrival of irrigation water in the irrigation project areas of Northeast Thailand will call for considerable attention to be paid to changes in the land holding pattern, which will need to be carefully regulated if the maximum number of farmers are to receive benefit from the new facilities.

CHAPTER V

THE UTILISATION OF LABOUR RESOURCES IN THE LAM PAO AREA

Next to land, labour constitutes the most important input in traditional agriculture and, as with land, the organisation of labour resources is closely related to the physical conditions under which agriculture is practised, and the responses of farmers to those conditions. In planning for agricultural modernisation, investigation into labour utilisation practices is as important as an examination of the land tenure situation. The success of calls for agricultural diversification and intensification can depend very much on the adequacy of farm labour. The adequacy of the labour force must be judged on its ability to adapt to new techniques of cultivation and its availability in sufficient strength at the right time. Availability is dependent on the varying demands within agriculture of particular enterprises, the labour requirements of which may vary considerably. Availability is also affected by the existence of competition from sources outside agriculture for that labour, sources which may offer a better return to the labour force. These considerations and others will be discussed below in the context of the Lam Pao study area.

The labour supply situation cannot be seen in a vacuum, however, and in Thailand note must be taken of a rate of population increase which has been recorded at 2.66% per annum

during the intercensal period 1960-1970.[1] Again, labour supply must be viewed in the context of national planning policy which cnntinues to see agriculture as the dominant sector influencing national growth for many years to come. Thus, it cannot be expected in the near future that the number of people available for agricultural work is going to decrease; indeed, although it is possible that there may be, throughout the country, a proportional decrease in the labour force employed within agriculture, it is clear that there will be a numerical increase.

A recent study by Fuhs and Vingerhoets[2] has attempted to assess the current trends in employment in Thailand. They note that the present movement is away from agriculture. Whereas the population census of 1960 recorded that 81.6% of the total employed population was in agriculture,[3] the National Statistical Office labour force survey of 1969 showed a fall to 78.3%.[4] These figures, however, deserve closer inspection. It is clear that in Thailand

> "Quite a number of people are alternatively active in two (or even more) sectors of the economy." 5

Thus the timing of the actual survey is crucial if comparison is to be made with other findings and Fuhs and Vingerhoets

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1. National Statistical Office, "Thailand Statistical Yearbook 1970-71", Bangkok 1972, Table 12, p.37.
2. Fuhs,F.W. and Vingerhoets,J., "Rural Manpower, Rural Institutions and Rural Employment in Thailand", NEDB, Bangkok 1971.
3. National Statistical Office, "Thailand: Population and Housing Census 1960", Bangkok 1962, Table 17, pp.36-43.
4. Fuhs and Vingerhoets, op.cit., Table 6, p.8.
5. Ibid., p.8.

have pointed out that the population census was taken in April 1960 during the off-season for farm work and when the numbers employed in agriculture might be lower than normal.[6] On the other hand, the 1969 Labour Force Survey was conducted in July and September when the farm population might be expected to be at its highest. Thus it would appear that the actual fall in the proportion of the labour force employed in agriculture could be rather larger, but as Muscat notes

> "This widespread practice of carrying out occupations in two or more sectors, or in two or more occupational categories, limits the usefulness of labour force distribution data for structural analysis in Thailand." 7

Whatever the actual present trends in the distribution pattern of the labour force in Thailand, it does seem certain that there will be a large increase in the total available labour force within the next fifteen years. In 1960, the farm labour force, not including those employed in forestry and marine fishing was estimated at some 10.25 million; by 1970 this total had increased to 12.19 million and it is projected that by 1985 there will be a further growth to 18 million.[8] Although it may be expected that non-agricultural employment will grow to upwards of 6 million by the same date, based on a slower projected increase in non-agricultural production after 1970, this sector will be unable to absorb more than a small fraction of the total labour force rapidly

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6. Ibid.

7. Muscat, R.J., "Development Strategy for Thailand", New York 1969, p.55.

8. Fuhs and Vingerhoets, op.cit., Table 18, p.10.

becoming available in the huge youthful population in Thailand at the present time.[9]

The future necessity for the large-scale absorption of labour in the agricultural sector in Thailand raises the question of unemployment or underemployment in rural areas. Indeed, a glance at the apparent inactivity in many villages in Thailand at certain times of the year would seem to testify to the assumption that there is a large surplus of agricultural labour even at the present time. However, as Clark and Haswell point out

> "...the requirements for labour are far from evenly distributed throughout the year. Periods of idleness, sometimes prolonged,...are followed by intense activity, when every hand is needed, including children, and any labour withdrawn from agriculture at this season has serious consequences for output." [10]

Indeed, it is often necessary to extend the search for labour outside the immediate farm family at such times of heavy labour requirements. Nor can it be said that available labour, apparently unused at certain times of the year, will be immediately ready to be utilised for production. This can depend on the nature of the task, the circumstances of the particular family and also whether the farmer considers it worth his while to invest more resources in agriculture in relation to his needs and the relative returns which will be derived.

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9. Ibid., Table 7, p.9.

10. Clark, C. and Haswell, M.R., "The Economics of Subsistence Agriculture", London 1964, p.93.

> "The most extreme seasonal inequalities in the demand for labour arise in the agriculture of monsoonal countries, where work has to be concentrated in a short wet season." 11

This is, of course, the case in Northeast Thailand, where the erratic arrival and amount of the rainfall mean that cultivation of the staple glutinous rice crop is often concentrated into a very short period indeed - as soon as the rains have provided sufficient moisture for the easy working of the paddy. Such delays do not mean that the labour force required for paddy cultivation can find employment elsewhere. The erratic arrival of the rains effectively ties down the farmer and his family in waiting for the time to begin cultivation, when all hands are needed. All members of the work force remain on standby.

Labour in Rice Cultivation

Rice, mainly of the glutinous variety, dominates the receipt of agricultural labour inputs in the region. In the Lam Pao sample survey much the largest proportion of the total labour invested in cultivation continued to go on the staple rice crop. In each of the first two years of survey enumeration, the overall proportion remained fairly constant; in 1970-71, for instance, rice cultivation took 115.1 mandays per household, comprising 75.1% of the total, while in the following year this percentage increased slightly to 76.3%. Most of this went to the dominant glutinous rice varieties,

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11. Ibid., p.95.

with non-glutinous rice claiming only 2.2% in the first enumeration and only a slightly higher proportion in 1971-72 when there was an increase in the area planted to it. The dominant position of rice as the main recipient of farm labour is further demonstrated by Table V-1 which indicates that only 16.8% of farmers invested less than 50% of their labour in this staple crop, most of these being in the one village of Ban Tum, where kenaf cultivation is particularly important. Outside Ban Tum only 16 farmers in the survey fell below the 50% level.

Further indication of the importance of labour investment into rice cultivation in the area is given when household labour inputs are compared on a cash basis with other cash inputs into the crop. If each manday of unpaid labour input is valued at the current rate of pay for hired labour in paddy cultivation, namely 7 baht per day in 1971-2, then the value of unpaid labour per rai is 83.6 baht compared to a total real cash input of just 20.2 baht. This latter total is composed of investment in fertiliser of 13.4 baht per rai, in insecticide of 0.3 baht per rai, in land rent of 2.3 baht per rai and in hired labour of 4.1 baht per rai. Thus it may be said that labour accounts for 79.0% of the total investment in glutinous rice, or 82.9% if hired labour is also included.[12]

The significance of the investment of labour resources into the rice crop may be seen when labour inputs are related to rice yields. Correlation and regression analyses of labour

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12. A very similar figure of 81.7% for the labour input share in total investment into glutinous rice cultivation was recorded in 1970-71.

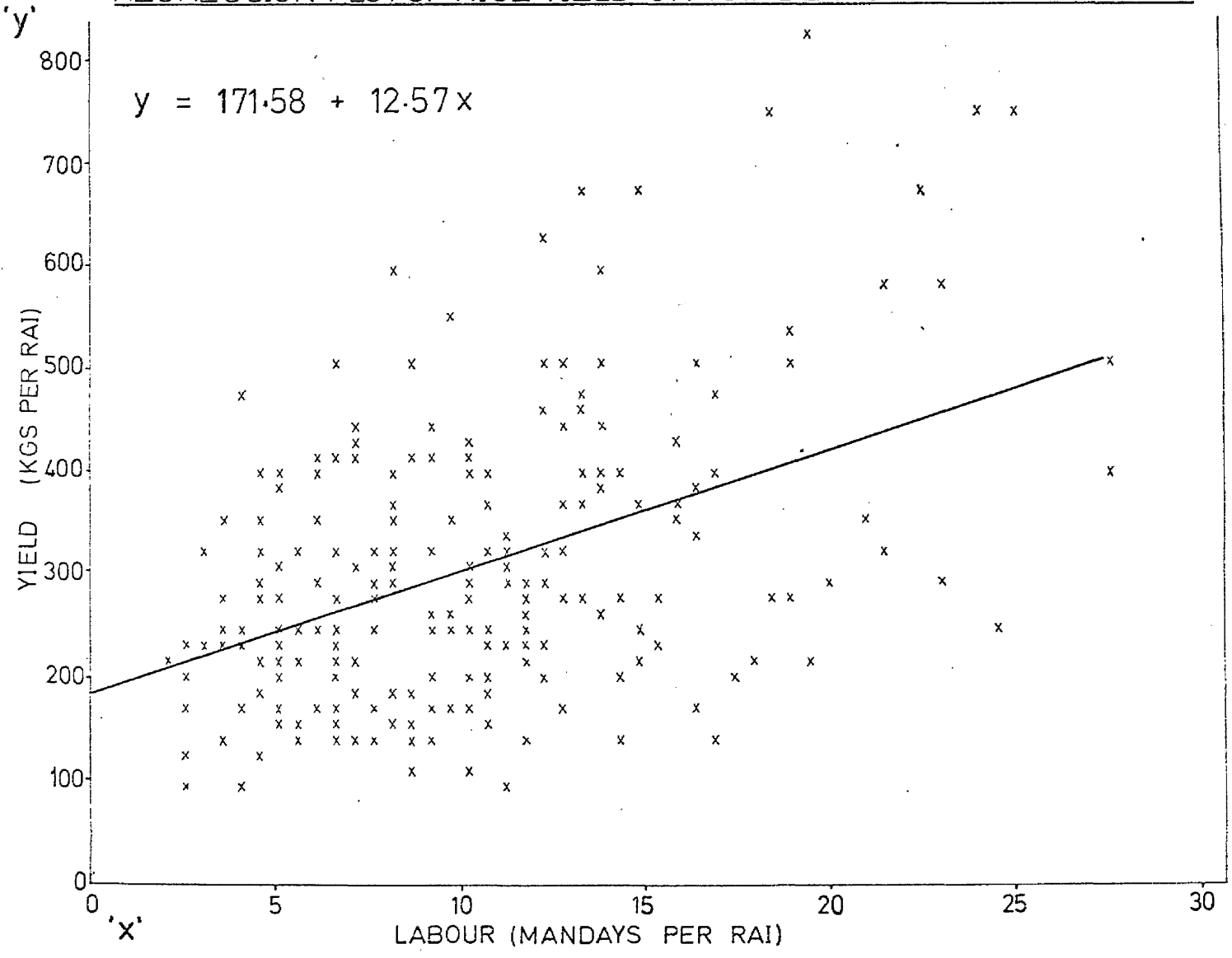
TABLE V:-1

Distribution of Labour Inputs on Glutinous Rice as Percentage of Total Labour Inputs Households in Lam Pao Area by Village 1970-71

VILLAGE	Percentage							
	0	0-40	40-50	50-60	60-70	70-80	80-90	90-100
	No. of Households							
BAN NA CHUAK NUEA	1	2	1	1	6	6	3	15
BAN TUM	-	7	17	11	4	11	1	6
BAN UM MAO	-	1	2	-	-	6	6	20
BAN FAI TEK	-	1	4	1	1	3	2	13
BAN LEK	-	-	-	3	1	8	5	25
BAN NON SUNG	-	1	-	3	6	7	8	8
BAN LAO YAI	-	1	2	2	2	-	3	1
LAM PAO AREA	1	13	26	21	20	41	28	88
% LAM PAO AREA	0.4	5.5	10.9	8.8	8.4	17.2	11.8	37.0

FIGURE V-1

REGRESSION PLOT OF RICE YIELD ON TOTAL LABOUR PER RAI ON RICE



inputs for each process of paddy cultivation and yield for the households of the Lam Pao sample survey showed that while all processes were significantly correlated with yield, the highest correlation was between total labour per rai and yield ($r = 0.46$). The associated regression equation was

$$y = 171.58 + 12.57x$$

where 'y' is yield (in kilogrammes per rai), and 'x' the total number of mandays per rai. The regression plot is presented in Figure V-1.

However, it was clear that a large part of the variation in yield could not be explained by variation in labour inputs alone and the size of a plot was also important as may be seen by the equation

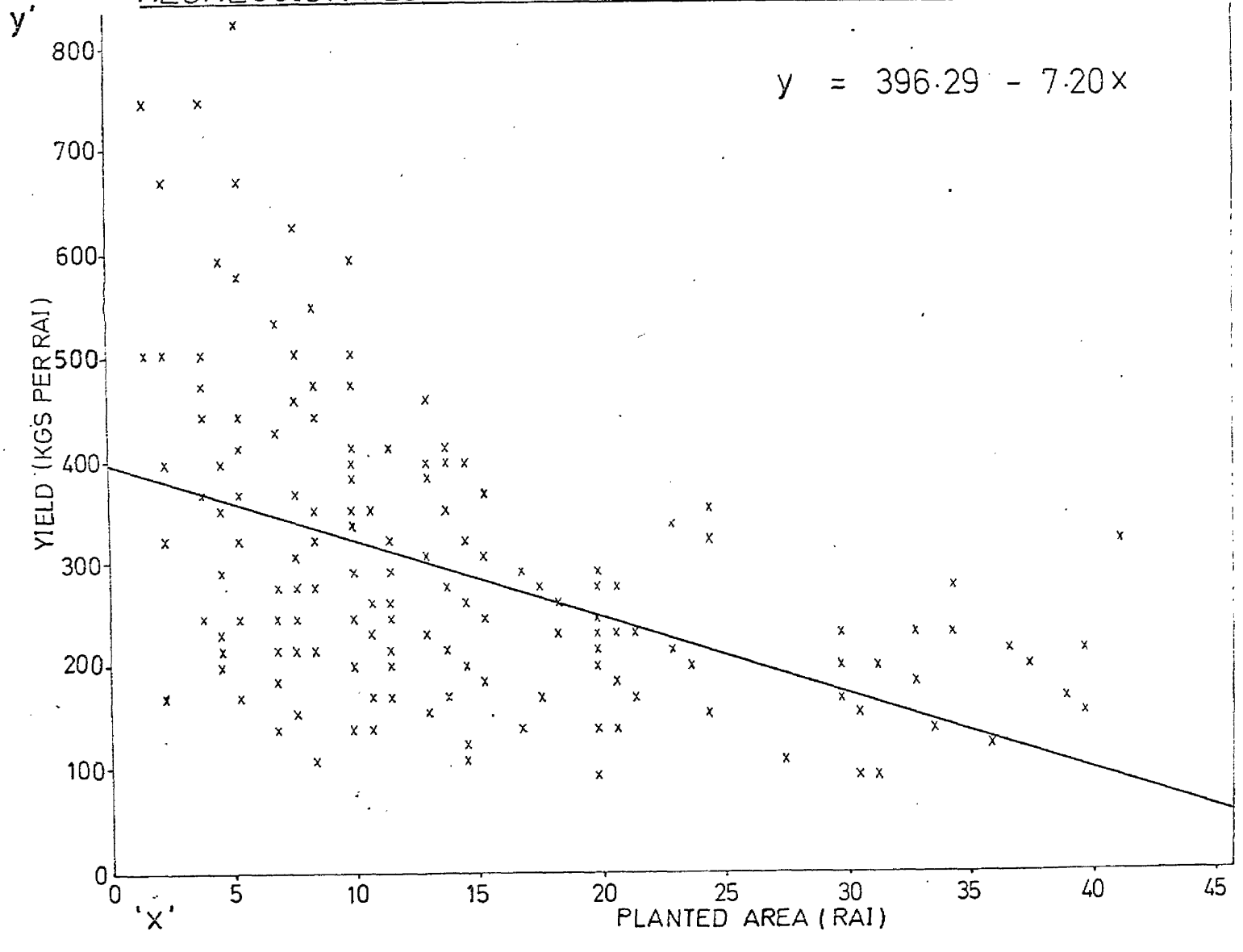
$$y = 396.29 - 7.20x$$

where 'y' is yield (in kilogrammes per rai) and 'x' the area planted (in rai). The yield does show a steady decline as the size of plot increases (Figure V-2). Indeed recourse to a multiple regression analysis showed that size of plot and the percentage of crop damage did offer slightly higher percentage explanation of the variation of rice yield than labour inputs, or indeed cash inputs, and thus masked the effects of the differences in the level of intensity of cultivation. Where, however, the damage factor was eliminated, it was clear that paddy did respond to labour inputs, particularly those into land preparation.

Figure V-1 does not suggest a point at which the marginal returns from increased labour inputs begin to fall off, although this is pointed out in other situations by such as Clark and

FIGURE V-2

REGRESSION PLOT OF RICE YIELD ON AREA PLANTED IN RICE



Haswell.[13] Thus it is impossible to state categorically that in the Lam Pao study area labour could be removed from the land without affecting the crop yields. On the other hand, it is quite clear that there exist within the Lam Pao sample survey a number of households who have the converse problem - that of insufficient labour to work the whole of their plot, at least at certain times in the farm calendar. It does not seem that for most households such shortages are chronic, although some are the result of social emergencies such as the migration of sons or daughters or the death or disappearance of a spouse. More likely is the case where shortages are but temporary and occur at the very short periods of intense farm activity associated with transplanting and harvesting, which are sometimes compacted further by climatic difficulties.

In fact in general terms, the agricultural labour requirements of a farm family as recorded by the Lam Pao sample survey do not appear to be very heavy, although as the above discussion has suggested, the investment of labour per unit area on rice cultivation tends to vary according to the size of holding. The average input of labour per household was recorded as 153,2 mandays per farm family for the crop season 1970-71, which represents just 40.3 mandays per adult in the average farm family.[14] Of this total labour requirement some 112.3 mandays were concentrated on the cultivation of paddy. This gives an average input of about 8.6 mandays per rai on glutinous rice and a slightly higher

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13. Clark and Haswell, op.cit., pp. 103ff.

14. Household labour only.

9.8 mandays per rai on non-glutinous rice. As Table V-2 for the following year indicates, however, farmers reported using as little as 4.0 mandays per rai, particularly in Ban Na Chuak Nuea, and as much as 30-40 mandays per rai, with the largest percentage of heavy inputs being found in the villages of Ban Lek and Ban Fai Taek with their problem of population pressure. The mass of farmers generally invested between 6.0 and 12.0 mandays per rai, with an overall household labour average of 11.2 mandays per rai. Given an average paddy area of some 10.6 rai, this meant an average total input of household labour of 119.1 mandays on glutinous rice, very similar to the previous year's level.

The Nature of the Farm Day

The calculation of mandays used above and elsewhere in this discussion requires some explanation. No allowance can be made for the length of the working day which varies from time to time and from farmer to farmer according to situation. Over a large sample the search for such detail was thought to be prohibitive, but a small sample of farmers was taken to assess the nature of the typical working day. This differed according to cultivation process. In general the ploughing process was governed by the strength and availability of draught animals. It was noted unusual for buffalo to work more than 6 hours in any one day and indeed the average time recorded in the sample was only 4.68 hours for the first ploughing and 5.5 hours for the rather easier second ploughing. Moreover buffalo tend to be badly affected by the intense heat of the midday sun, so that the common

TABLE V - 2

Distribution of Labour Inputs Per Rai of Glutinous Rice: Households in Lam Pao Area, by Village 1971-72

VILLAGE	Mandays/Rai								
	0-4	4-6	6-8	8-10	10-12	12-14	14-16	16-20	20-40
	No. of Households								
BAN NA CHUAK NUEA	5	3	7	5	6	4	2	2	3
BAN TUM	2	10	11	7	11	6	4	5	4
BAN UM MAO	1	6	6	8	5	2	1	1	2
BAN FAI TAEK	3	-	1	-	4	8	1	4	2
BAN LEK	-	4	6	4	5	3	7	8	5
BAN NON SUNG	4	2	12	8	4	3	2	-	2
BAN LAO YAI	-	-	2	3	1	2	1	2	1
LAM PAO	15	25	45	35	36	28	18	22	19
% LAM PAO AREA	6.2	10.3	18.5	14.4	14.8	11.5	7.5	9.1	7.8

practice appeared to be to work from 6.00 - 7.00 a.m. through to about 10.00 a.m. and then perhaps for a couple of hours in the late afternoon, between 3.00 p.m. and 6.00 p.m.

Where the use of draught animals was not involved, the working day tended to become more flexible. Transplanting in the small sample lasted an average of almost eight hours and harvesting extended typically for as much as nine. Again work began customarily early in the morning, but lasted, usually with a short break for breakfast, through until lunchtime. Activity would be renewed in mid-afternoon and continue to close on dusk, according to the proximity of the fields from the village.[15] In the case of threshing, it seemed quite usual for the work to take place even after dark by the light of oil-lamps, from about 5.00 p.m. to as late as 11.00 p.m.

It should also be noted that some of the processes in rice cultivation do take place simultaneously. Certainly with second ploughing and transplanting this is the case. It is common for the household head to begin ploughing early in the morning and for the women to follow him to the fields with the day's food rather later to begin the transplanting. Except on the first day, seedlings will have been pulled from the seedbed in the late afternoon of one day and left on the side of the plot for transplanting on the following day. Under a different system, one person may be pulling up the seedlings while a second transplants. Similarly at the height

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15. Some families, where the rice-fields are distant from the village are accustomed to stay in their field houses throughout the heavy labour periods. This is the case in Ban Non Sung and Ban Fai Taek particularly in the Lam Pao sample.

of the harvest season, sheaves of paddy are being carried to the threshing floor at the same time as the stalks are being cut, the former job perhaps that of one of the children of the family; again the nightly job of threshing may follow a day's harvesting, although the cut stalks must first be given a chance to dry.

In the light of such considerations attention can now be turned to Table V-3 which shows labour inputs by process in the Lam Pao sample survey. As can be seen, the inputs of labour described above are not spread evenly throughout the various processes of rice cultivation. The weeding process, which is rarely carried out separately in the Lam Pao area, took up only a small amount of the farmers' time. For ploughing and the other jobs involved in the preparation of the paddy, like renewing the bunds, the average farmer took about two days for each rai ploughed. The heaviest inputs were clearly required in the process of transplanting, including transportation of the seedlings from the seedbed to the field, and in harvesting the crop, including threshing, winnowing and carrying the rice to the household rice barn. Each took a similar amount of the farmers' time, to the tune of 3-4 mandays for each rai planted.

The calculations made from the initial enumeration did not seek to break down the structure of labour inputs in rice cultivation in any greater detail. In so doing they neglect the amount of labour expended on the preparation of the seedbed and perhaps underenumerate that committed to transplanting which process includes the second ploughing of the land prior to the insertion of the seedlings described above. Subsequent enumeration sought to improve on these

TABLE V - 3

Average Labour Inputs Per Rai on Glutinous Rice by Process
Lam Pao Area, 1970-71 - 1971-72. Household Labour Only

PROCESS	MANDAYS	
	1970-71	1971-72
First ploughing	(2.1)	2.1
Second ploughing	( )	2.3
Seed Bed Preparation	.....	1.0
Transplanting	3.2	2.8
Weeding	0.2	0.4
Harvesting, etc.	3.1	3.1
Total	8.6	11.7

omissions and the findings of survey in the 1971-72 crop season are presented for comparison in Table V-3. In fact the data for this year did reveal an essentially similar pattern to that encountered in the previous year. It may be that the search for information on the second ploughing period tended to rather inflate the amount of time spent in land preparation, for many farmers found it difficult to separate this process from the subsequent transplanting. Nevertheless both sets of figures do fall in line with more sophisticated estimates taken elsewhere in the Northeast.

The data gathered in the Lam Pao survey questionnaire was based exclusively on farmer recall and no attempt was made to examine the farmers at work in their fields to check the validity of the farmers' calculations of their own work rate. As a result it is interesting to compare the results with those obtained by other surveys. Unfortunately the results of the Chulalongkorn University enquiry in Kalasin province, which included work in Ban Na Chuak Nuea are not yet available,[16] but evidence is offered from the adjacent changwat of Udorn Thani.

This comes from a survey conducted in 1967 in Muang District of Udorn Thani which involved an intensive examination of labour inputs of six farm families through observation in the field in the course of a farm year.[17] Table V-4 presents

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16. A survey conducted by the Chulalongkorn University Social Science Research Institute, under the direction of Dr. Jacques Amyot.

17. Angkorn Kamolpatana and Lewis D.Walker, "Crop Labour Time and Motion Study of Selected Crops in Northeast Thailand" USOM, Bangkok 1969.

TABLE V - 4

Labour Inputs by Process Rice Cultivation

Udorn Thani Survey

Process	Labour Expended/Rai Man Hours	Approx. Man Days
Seedbed Preparation per Transplanted Rai	11.93	1.49
First Ploughing	5.33	0.67
Second Ploughing	7.28	0.91
Transplanting	25.85	3.23
Harvesting, Transporting	34.74	4.34
	85.13	10.64

Source: Angkorn Kamolpatana & L.D. Walker "Crop Labour Time & Motion Study of Selected Crops in Northeast Thailand". Bangkok, 1969.

the results of these findings for rice cultivation. These compare quite closely with the figures given by the farmers of the Lam Pao survey area in estimating their own rate of work. The possible over-enumeration of the preparation processes is perhaps confirmed.

It is clear from the above discussion that the main labour requirements in rice cultivation occur at the periods for transplanting and harvesting. At these times farmers are required to supply over three mandays of labour for each rai they wish to cultivate or have to harvest. In each case, they cannot afford to carry out the process over too long a period, the time they have available being governed by the climatic conditions. The uncertainty of rainfall can lead to significant crises in the cultivation process. One such crisis might be when farmers, having planted their seedbeds, find they are unable to complete the preparation of the paddy fields through the late arrival of the main rains. Although it ispossible to keep the present glutinous rice varieties, like Niaw Sanpatong, in the seedbed for up to 60 days without serious consequences, such circumstances will normally call for a very intensive application of labour when the rains do arrive. Farmers may indeed find it necessary to forgo the harrowing and levelling of the paddy mud, with a consequent reduction in water control and a possible fall in yields.[18] In especially dire situations,

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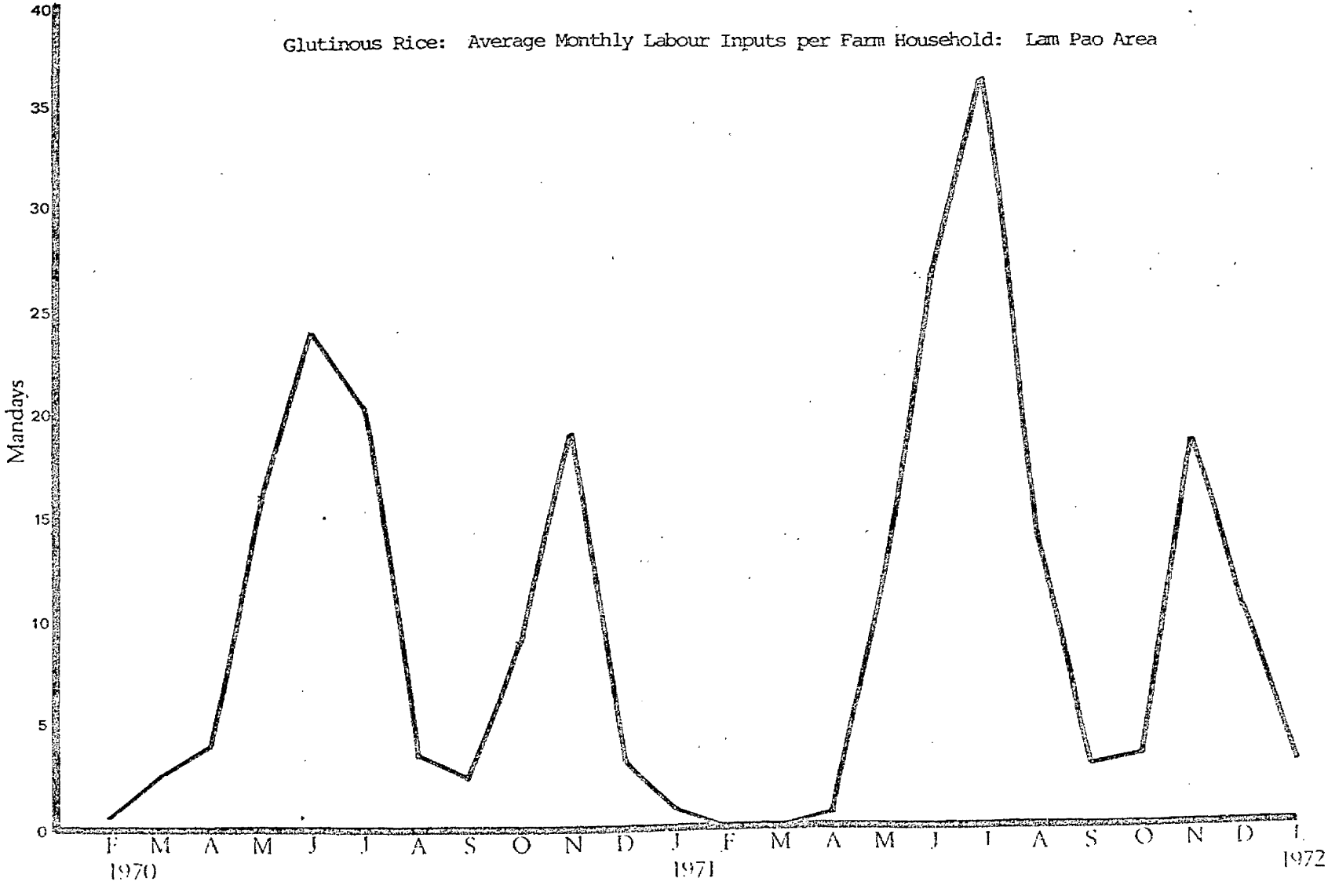
18. Ng, R.C.Y., "Some Land Use Problems of Northeast Thailand", Modern Asian Studies, volume 4(1), 1970, p.31.

FIGURE V-3


Glutinous Rice: Average Monthly Labour Inputs per Farm Household: Lam Pao Area
Mandays
40
35
30
25
20
15
10
5
0
F M A M J J A S O N D J F M A M J J A S O N D J
1970
1971
1972

it may be necessary, as was the case during the prolonged drought in 1972 in parts of the region,[19] for farmers to cultivate a second seedbed after the first has got too old, or even to abandon transplanting for broadcast seeding, again with a resultant decline in yields. Again, as the rice matures, it is necessary to complete the harvest as rapidly as possible to reduce the possibility of serious crop damage from birds, rats or other field creatures.

Monthly Labour in Rice Cultivation

The net result of these considerations is that the input of labour into rice is highly concentrated into two very short periods. Figure V-3 demonstrates the extent of this concentration for the two years of the Lam Pao sample survey by plotting the average monthly labour inputs per farm family.[20] In both years, labour inputs are strongly peaked in the period June-July and in November with intervening slack seasons coinciding with the late dry season (January-April) and in August-October. It would appear that, in general terms, 1970-71 was a year of rather earlier rains than 1971-72; farmers were able to transplant most of the seedlings in June

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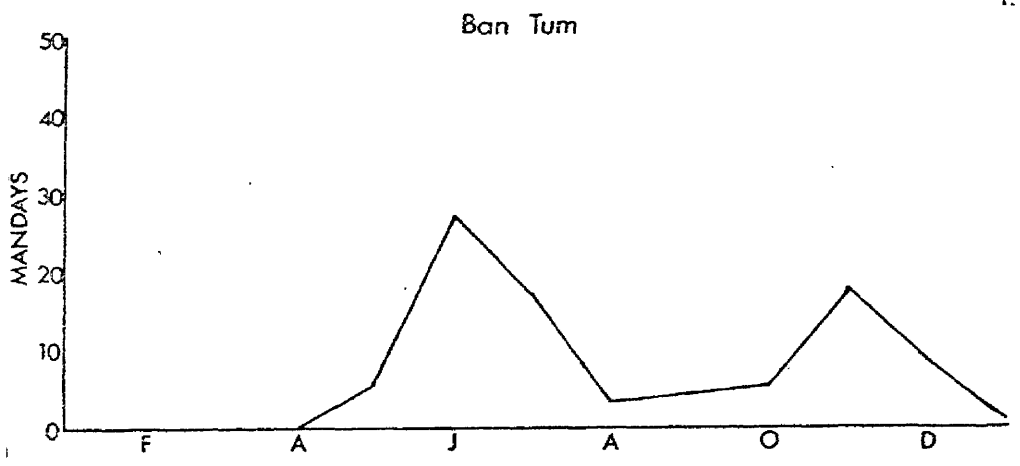
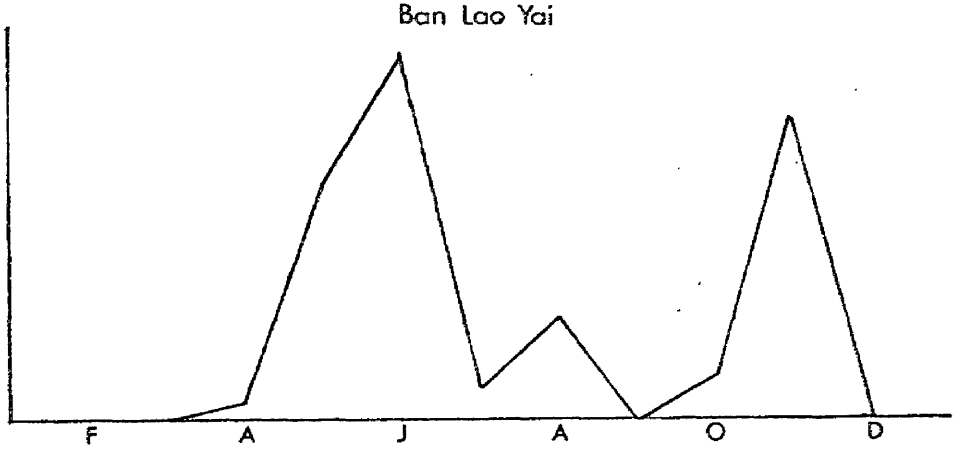
19. And again in the upland areas in 1974.

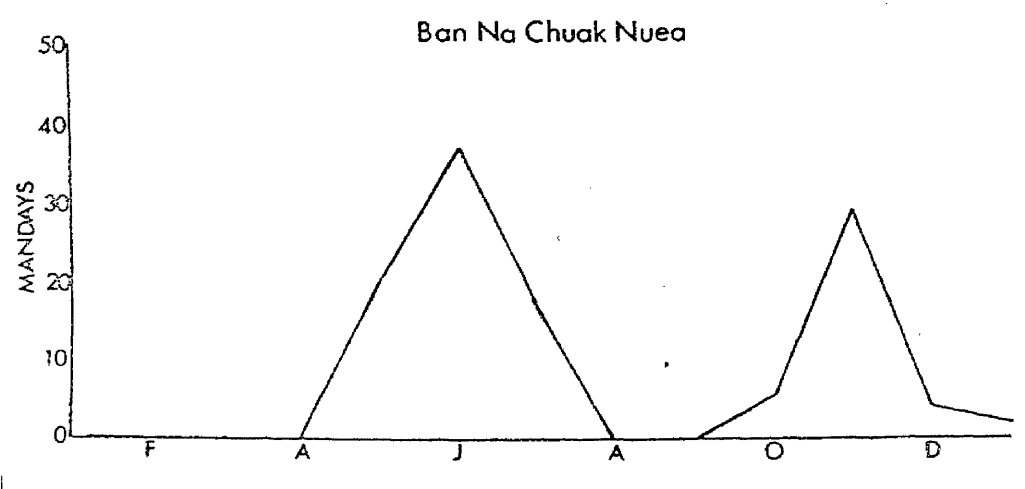
20. The calculation of monthly inputs was made by attributing the total amount of labour in mandays for each process to the month in which that process was said to have begun. It is clear that a particular process often extends over more than one month, but nevertheless the incidence of month of start of the process does represent to a considerable degree the actual concentration of labour. Weeding, the timing of which was not asked, was attributed to the month following the date of transplanting; thus for transplanting in July, weeding was attributed to August.

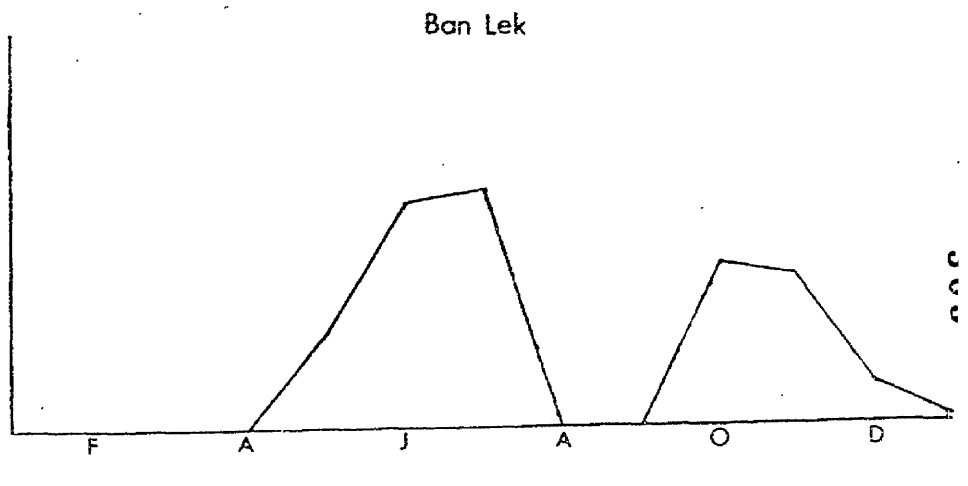
FIGURE V-4

Glutinous Rice : Average Monthly Labour Inputs per Farm Household : Selected Villages
1970–1971







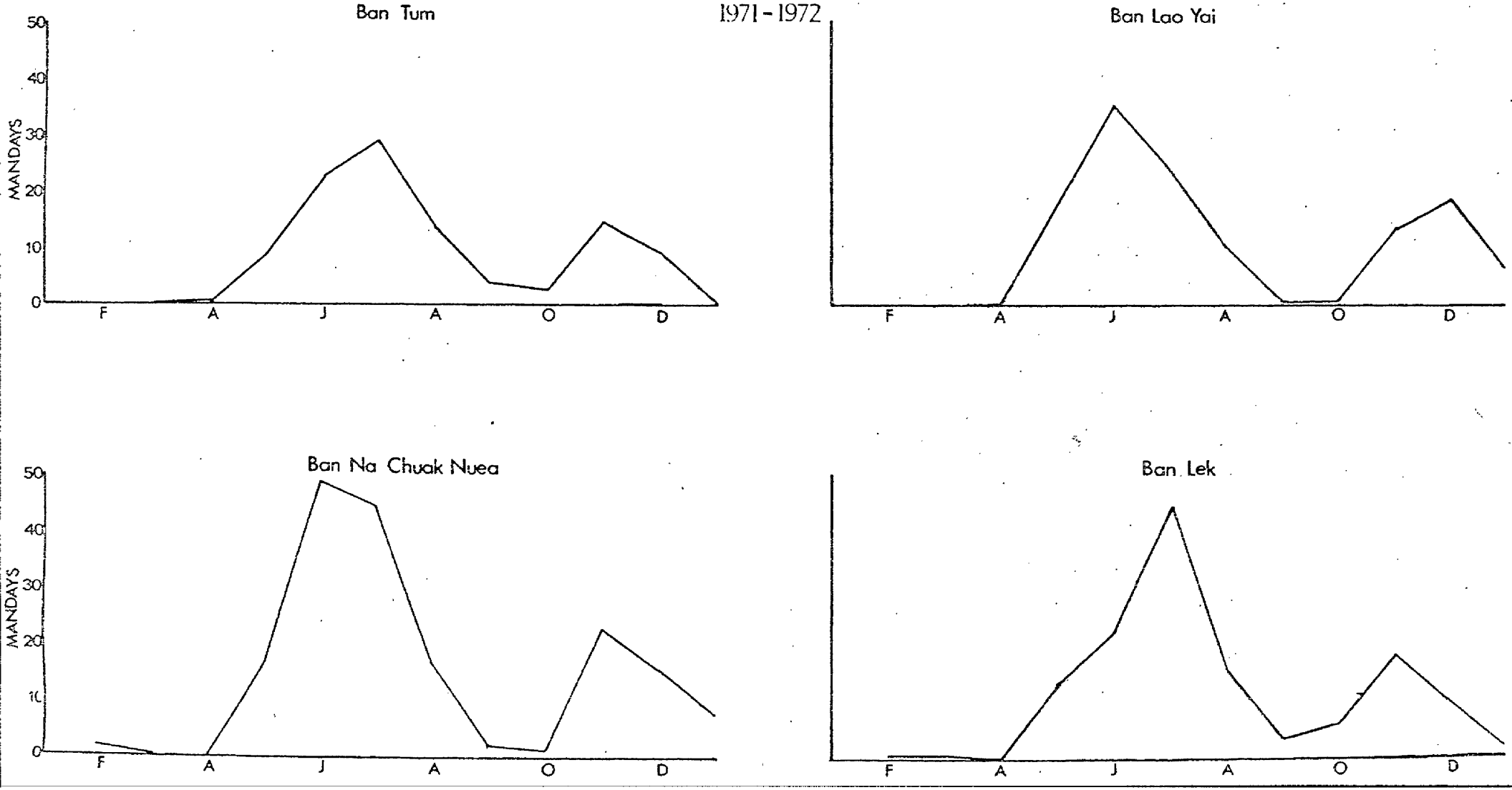


or July at the latest and the crop was ready for harvest in late October and November. In the 1971-72 crop season, land preparation and transplanting were spread over a slightly longer period and clearly a fair number of farmers were still transplanting in August. Harvesting did not begin until November and a large minority were engaged in this process in December and into January. The slightly later date did not affect crop yield, which, as was noted earlier, was rather higher in 1971-72 than in 1970-71.

If the inputs are broken down by village, as shown in Figures V-4 and V-5, the picture outlined above is generally confirmed, but the peaks are very much emphasised in certain locations. Only in Ban Lao Yai in 1970-71 and in Ban Tum in 1971-72 do we see land preparation started before May; in the former case the land in question was situated in the most low-lying area of the Chi flood plain, adjacent to a shallow lake, in the latter the farmer was an isolated case holding land adjacent to the 1L1 lateral near Ban Lao village. This example draws attention to the most interesting aspect of the pattern in 1971-72. In a slightly later crop season, only two villages show an early season peak in June rather than July. One of these, as might be expected is the flood plain site at Ban Lao Yai where enough moisture accumulated in the bottom lands to allow an early start; the second case is, on the other hand, in the higher upland area, at Ban Na Chuak Nuea. This would suggest an early influence of irrigation water supply, allowing those farmers in the sample with land within the irrigation project to begin their land preparation that bit earlier.

FIGURE V-5

Glutinous Rice: Average Monthly Labour Inputs per Farm Household: Selected Villages



Labour in Kenaf Cultivation

If the cultivation of paddy rice itself leads to a heavy demand for labour inputs at a few short periods of the year, the introduction of the other major crop of the Lam Pao area has not led to any great diversification of the labour use pattern. Some 60% of the farm households in the Lam Pao sample survey were engaged in kenaf cultivation. In 1970-71 it was calculated that each of these households invested an average of 59.1 mandays in kenaf cultivation; a similar figure was arrived at in the following year's enumeration, a slightly lower 50.7 mandays. If these totals are calculated on the basis of all households in the sample, they represent 35.6 and 31.1 mandays respectively and the overall labour investment in kenaf constitutes 23.2% of total labour inputs in 1970-1 and 18.8% in 1971-72.

Kenaf requires a rather heavier labour input per unit area than does the paddy crop. In Table V-5 it is clear that while there are many farmers who only commit 5-10 mandays of labour to each rai of kenaf planted, nearly half invest between 10 and 25 mandays and there are a substantial minority whose inputs are still heavier. Angkorn and Walker suggest a figure of just over 15 mandays per rai.[21] In general terms, as Table V-6 demonstrates, the ploughing and planting processes in kenaf cultivation are not as intensive as those for paddy, but the subsequent requirements are much more severe. Weeding is known to be a very important cultural practice in kenaf cultivation with an input of about three mandays per

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21. Angkorn and Walker, op.cit., Table 1, p.3.

TABLE V - 5

Distribution of Labour Inputs Per Rai on Kenaf: Households

Households in Lam Pao Area, by Village

1971-72

VILLAGE	MANDAYS/RAI 0-5	5-7.5	7.5-10	10-15	15-20	20-25	25+
	No. of Households						
BAN NA CHUAK NEUA	2	5	4	4	4	3	1
BAN TUM	5	8	13	12	9	7	2
BAN UM MAO	1	3	-	-	1	1	2
BAN FAI TAEK	1	1	1	2	-	1	1
BAN LEK	3	2	5	3	4	3	7
BAN NON SUNG	1	1	2	5	4	5	3
BAN LAO YAI	2	1	1	1	-	-	2
LAM PAO AREA	15	21	26	27	22	20	18
% LAM PAO AREA	10.1	14.1	17.4	18.1	14.8	13.4	12.1

TABLE V - 6

Labour Inputs on Kenaf by Process

Lam Pao Survey 1970-1-2

Process	1970-1 (Mandays/Rai)	1971-2 (Mandays/Rai)
Land Preparation	2.3	3.3
Planting	3.0	3.0
Weeding	3.1	2.6
Harvesting etc.	4.0	6.7
	12.4 *	15.6
	*excluding hired and unpaid supplementary	includes all sources

rai cultivated. This process is the only practice in kenaf cultivation in which the extent of labour inputs shows any significant relationship with level of yield. It is the harvesting period, however, which calls for the greatest outlay of labour resources. This period involves not only the cutting and binding of the stalks but also their subsequent soaking to loosen the fibre and the stripping of the fibre. Although these final processes are difficult to calculate in area terms and largely depend on total yield - Angkorn and Walker estimate an outlay of 27 man-hours for each 100 kilogram harvested[22] - nominally over 6 mandays per rai are required for the whole harvesting process.[23] (Table V-7)

Monthly Labour in Kenaf

In a favourable year, kenaf cultivation should not conflict with rice for a farm family's labour. In such a case, late dry season showers will allow the upland to be ploughed, whether by buffalo or by tractor, in March or April and the kenaf itself will usually be planted soon afterwards in April or early in May. The crop which takes

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22. Angkorn and Walker, op.cit., Table 1, p.3.

23. The daily labour regime invested in kenaf differs little from that described for rice. Unless this is carried out by tractor, a day's ploughing usually constitutes some 3-5 hours early in the morning. The planting of the kenaf seeds normally immediately follows or is carried out at the same time, but usually involving more people. Again where draught animals are not involved the human working day is longer. Weeding is most flexible, depending on the intensity of cultivation, but cutting commonly lasts at least eight hours per day and stripping may be even longer. It is notable, however, that this latter process never extends past dusk.

TABLE V - 7

Labour Inputs on Kenaf

Udorn Thani Survey

	Man hours
Land Preparation	12.46
Planting	4.25
Harvesting and Processing	112.20
	128.91

Source: Angkorn Kamolpatana & L.D. Walker "Crop Labour Time & Motion Study of Selected Crops in Northeast Thailand". Bangkok, 1969.

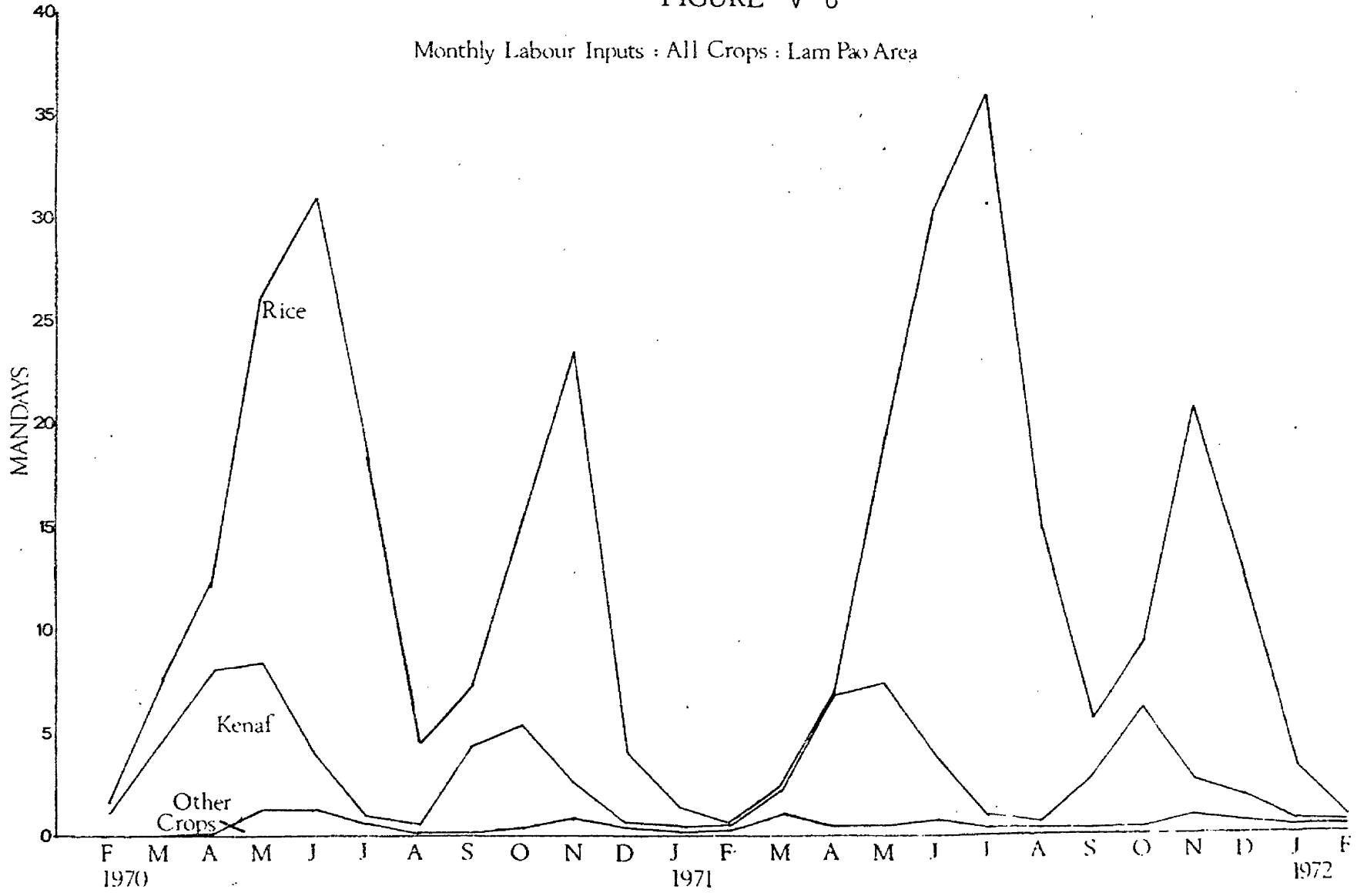
upwards of five months to mature will then be ready for cutting in October; indeed it may even be ready in late September and in either case the cutting certainly does not conflict with the paddy harvest in late November and December. Thus the periods of peak activity in kenaf cultivation miss the corresponding peaks in the rice calendar.

It is, on the other hand, necessary to make some qualifications to this statement. If the distribution of labour inputs by month into kenaf are examined and this distribution superimposed on a graph showing the distribution of activity on rice, it will be seen that the separation between the two cropping patterns is not as discrete as was suggested above. (Figure V-6). Two possible areas of conflict for labour resources appear to exist. The most important of these is at the period of kenaf weeding. As was noted previously, the timing of the weeding process for kenaf, as well as for rice, was not recorded in the sample survey. It is clear, however, that this process takes place some four to six weeks after the seed has been planted, occurring, therefore, mainly in May or early June, coincident with the time for preparation of the paddy plots. It has been suggested that the weeding process is fairly crucial for the success of the kenaf crop; it may be assumed, however, that the farmer will not prejudice the success of paddy cultivation to carry out this process on his kenaf. The kenaf suffers when any clash of interests is likely.

The second possible conflict between the demands of kenaf and rice for available labour may be at the time of the rice harvest. Although the peak of kenaf cutting is generally over by October, after cutting, the kenaf is left to soak

FIGURE V-6

Monthly Labour Inputs : All Crops : Lam Pao Area



before stripping ideally for a period of three to six weeks. This may bring the period of stripping into line with the rice harvest. To overcome this, the kenaf may be stripped with the minimum of soaking or it may be left in the field unretted until the completion of the rice harvest. In the latter case, there may be a danger of insufficient water. In either eventuality, the fibre quality is likely to deteriorate.

Labour Availability

The introduction of kenaf cultivation into the Lam Pao area has not made the organisation of labour resources at the periods of intense activity in the farming calendar any easier. But even those farmers who do not grow kenaf may, in circumstances of unreliable rainfall, be faced with such crises in which labour in the immediate nuclear household alone may be insufficient. Of course, the Thai farmer is assisted in the management of his labour resources by their very flexibility. It is well known that the contribution of female labour in Thai agriculture is among the higher participation rates in the world[24] and indeed, for some of the more delicate processes, female labour is preferred to male. As Kuchiba and Tsubouchi note in another context

> "..there is a precisely defined sexual division of labour under which the men undertake the tillage of land and the threshing of the rice while the women are responsible for transplanting

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24. Fitzsimmons,T., (ed.) "Thailand", New Haven 1958, p.273. quoted in Myrdal, Gunnar, "Asian Drama", London 1968, footnote 4, p.1072.

and harvesting.[25]

In Thailand, this division is not precisely defined, especially at harvesting, but its general characteristics are followed where labour of both sexes is available.

Any assessment of such labour availability is fraught with problems. According to Ingersoll,

> "A full-time worker, to a farmer, usually means a member of the household who helps with each of the major phases of rice culture." 26

This would seem, however, to severely underestimate the contribution of full-time family labour. Women, although they do not help with the ploughing, are clearly full-time farm workers except when family affairs or pregnancy prevent them from taking part. Moreover, other members of the family, although not necessarily called upon for each process are full-time workers who are available when required.[27]

Although most labour use surveys carried out in Thailand assess available labour as consisting of able-bodied adults between the ages of 15 and 65,[28] it is apparent from investigations at Lam Pao that, when required, children under 15 do help substantially in rice cultivation. Conversations with headmen and other villagers on this very point led to the

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25. Kuchiba M. and Tsubouchi,Y., "Paddy Farming and Social Structure in a Malay Village", Review of Agricultural Economics of Malaysia, vol. 2(1), June 1968, p.20.

26. Ingersoll,J., "The Social Feasibility of Pa Meng Irrigation Requirements and Realities", Bangkok 1969, p.131.

27. In upland villages adjacent to the Lam Pao irrigation area, where drought had led many young people to migrate to work in Bangkok between 1973 and 1975, early rains in that latter year led fathers to ask them to return to help in cultivation. Most responded to the call.

28. For example by Fuhs and Vingerhoets, op.cit.

TABLE V - 8a

Distribution of No. of Persons in Household Involved in Ploughing Glutinous Rice, Lam Pao Villages 1971-2, By Plot

VILLAGE	No. of Persons					
	1	2	3	4	5	6
	No. of Plots					
BAN NA CHUAK NUEA	14	28	6	2	-	-
BAN TUM	40	35	5	5	-	-
BAN UM MAO	18	13	2	1	3	1
BAN FAI TAEK	13	4	2	-	2	-
BAN LEK	26	24	3	6	1	-
BAN NON SUNG	12	24	6	4	1	-
BAN LAO YAI	5	5	2	1	-	-
LAMP PAO AREA	128	133	26	19	7	1

conclusion that most children would be making an effective contribution to agricultural work by the age of 10 and, indeed, that such children would be looking after cattle and buffalo at an even earlier age. It was also pointed out that school attendance was immaterial in this matter, for the village schools normally closed down during the agricultural labour peaks.[29] For elderly persons, the extent of their contribution depended on their health. In some villages, notably Ban Non Sung and Ban Fai Taek, it was common at the times of peak labour requirement, notably at harvest, for the whole family to move out to their fields, leaving their village house shut up, in order to maximise the family contribution to labour requirements.

The flexible nature of the labour supply from the farm household in the Lam Pao area may be seen from Tables V-8a, V-8b and V-8c. These show the number of labour units from the household used for each of the main processes of paddy cultivation on each plot. Whereas for ploughing, only one or two members of the family were engaged, depending on the number of buffalo the household had available, for transplanting the labour force was normally at least two and frequently three or four. For harvest the labour force showed a yet greater expansion with 38.7% of plots being worked by four persons or more. It may be added that a similar pattern exists with kenaf cultivation, although the number of people involved in

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29. The erratic timing of the farm year does mean that the contribution of children can be reduced. Moreover, the increase of the minimum period of compulsory education from four years to seven years is also working against children making a major labour contribution. Children are now normally finishing schooling at the age of 13-14.

TABLE V - 8b

Distribution of No. of Persons in Household Envolved in Transplanting Glutinous Rice, Lam Pao Villages 1971-2, by Plot

VILLAGE	No. of Persons					
	1	2	3	4	5	6+
	No. of Plots					
BAN NA CHUAK NUEA	5	11	12	13	6	5
BAN TUM	5	37	23	12	2	2
BAN UM MAO	4	12	7	8	5	2
BAN FAI TAEK	3	9	6	-	2	-
BAN LEK	2	24	18	12	3	-
BAN NON SUNG	-	13	12	13	5	3
BAN LAO YAI	2	2	4	3	1	-
LAM PAO AREA	21	108	82	61	24	12

TABLE V - 8c

Distribution of No. of Persons in Household Involved in Harvesting Glutinous Rice, Lam Pao Villages 1971-72, by Plot

VILLAGE	No. of Persons					
	1	2	3	4	5	6+
	No. of Plots					
BAN NA CHUAK NUEA	3	14	11	14	5	5
BAN TUM	1	32	18	22	8	4
BAN UM MAO	-	12	8	6	7	3
BAN FAI TAEK	-	11	7	1	2	-
BAN LEK	-	17	23	15	4	1
BAN NON SUNG	1	10	14	13	9	1
BAN LAO YAI	-	2	8	2	1	-
LAM PAO AREA	5	98	89	73	36	14

both the main processes of weeding and cutting is never as large as in paddy cultivation. In harvesting only 26% of plots are operated by four persons or more and in weeding only 18.3%.

Nevertheless, despite the flexibility of the supply of household labour, the fact remains that labour shortages are a problem for a number of households in the Lam Pao area. The shortages suffered by such households arise from a variety of reasons. They may only be temporary, arising from illness or pregnancy, they may be felt only at particular periods, as might be the case with a family without male workers at the ploughing season; they may occur through the need for greater urgency at a period of poor weather conditions; finally they may be chronic shortages, such as on large holdings newly inherited by a young family with few labour resources.

What is certain, however, is that these problems are not new for the farmers of the area, for the agricultural system has been adapted to solve them. One answer was to cultivate a variety of strains of rice maturing at different periods in order to spread the labour demand over a longer period; the recent widespread adoption of the semi-improved strain Niaw Sanpatong has reduced the effectiveness of this practice, although Sanpatong is still cultivated alongside the slower-maturing, locally-developed Kamphai-Taichung strain.[30] On the other hand, the main answer to the problem of labour

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30. Kamphai-Taichung was developed at Huay Sithon by crossing local and Taiwanese strains. Its main advantage is not its longer growth period, but its greater height, enabling planting in deep flood conditions.

shortages has been the development of mutual-help labour arrangements, whereby families with a labour problem are assisted by members of their extended families or by other friends from the village at time of crisis.

Labour Assistance Networks

Moerman, in his study of a village community in Chiangrai province in the Northern region of Thailand, recognises a number of forms of mutual help network.[31] One, which he calls 'fellowship', seems to be chiefly a feature of the extended family system. Although help may be given to an individual farmer by relatives and very close friends, there is no explicit reciprocal agreement built into the arrangement. Those who come to help do so

> "..in order to maintain a close relationship with the recipient of their labour." 32

and as Ingersoll suggests

> "...they tend to help...without calculating their time very closely." 33

Moerman distinguishes this 'fellowship' form of mutual assistance from what he terms 'exchange', which is a reciprocation of farm labour for farm labour given. It may involve an agreement by two or three families to work their land together at one or more seasons of the year or there may be a temporary

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31. Moerman,M., "Agricultural Change and Peasant Choice in a Thai Village", Berkeley 1968, pp.116-117.

32. Ibid., p.117.

33. Ingersoll,J., (1969), op.cit., p.138.

agreement between farmers as the need arises. In this latter case, the arrangement can also vary in the strictness of reciprocity; in some cases there will be no necessity to return the same service as has been given, nor need the return be immediate; in other cases, the recipient farmer should return a day of male harvesting labour for every day he has received.

In general the number of people involved in such mutual assistance arrangements is small - confined to only two or three co-operating families. Yet de Young[34] and other writers on the social organisation of the Thai village[35] note work groups consisting of 35-45 members and it is clear that such large groups do exist also in the Lam Pao area. Whereas de Young implies their general presence, however, in Kalasin they seem to be confined mainly to the harvest period. At this season, the phenomenon of 'longkhaek'[36] or large-scale help groups is still quite a common feature, although it is concentrated in those villages where the traditional social system is most strongly maintained. Large groups of villagers combine to reap and thresh the various fields of the participants in turn with the recipient farmers providing their friends with rice and refreshment during and at the end of the day. The whole affair is more of a social occasion than a chore for the labourers, who may or may not

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34. de Young, J.E., "Village Life in Modern Thailand", Berkeley 1955, p.78.

35. Evers, Hans-Dieter, (ed.), "Loosely Structured Social Systems: Thailand in Comparative Perspective", New Haven 1969.

36. 'Longkhaek' may be translated as the 'coming of the guests', which sums up the nature of the arrangement.

have their own rice to harvest; thus the arrangement becomes a mixture of mutual help and hire of labour with those whose land is not involved being paid in kind.

Not only the large-scale 'longkhaek' but also the more intimate 'fellowship' and 'exchange' arrangements are to be found in the Lam Pao area. There are also some cases of families working together in combination on combined holdings with each taking their share of the produce. These do not constitute share-cropping agreements, but are merely a combining of resources, usually by members of the same extended family. This form of co-operation is however rare; they are of marginal significance in comparison with the two types of arrangement previously described.

In 1971-72, the Lam Pao sample survey investigations tackled the question of the extent of use of these various types of supplementary labour from two different angles; farmers were asked if they or members of their family had gone to help other farmers at any time in the course of the year and they were also asked if they themselves had received assistance from friends, relatives and other sources during each of the main processes of cultivation. In this way some assessment could be made of whether such networks were strictly internal to particular villages or whether they showed a net inflow of labour into or outflow of labour from the irrigation area. In fact the returns from the two lines of enquiry were remarkably even, suggesting that the labour networks do indeed function within individual villages rather than between them.

The questions included in the 1971-72 survey revealed

TABLE V - 9a

Mutual Help Networks: Period of Commitment, Lam Pao Villages 1971-72

VILLAGE	DAYS 1	2-3	4-5	6-10	11-20	20-100	Total Cases
	No. of Households						
BAN NA CHUAK NUEA	-	7	1	2	2	-	12
BAN TUM	2	4	5	3	1	2	17
BAN UM MAO	1	3	-	1	1	-	6
BAN FAI TAEK	1	2	-	-	-	-	3
BAN LEK	-	6	1	3	-	-	10
BAN NON SUNG	2	4	3	5	-	-	14
BAN LAO YAI	1	-	-	2	1	-	4
LAM PAO AREA	7	26	10	16	5	2	66

a fairly widespread participation in and use of the different mutual help networks by the farming population. Of the 243 households in the sample survey, some 91 cases (37.4%) said that they had given some form of unpaid labour assistance to friends or relatives in the previous year. Some families had been active only in the context of the large-scale 'longkhaek' arrangements (26.4% of those involved), while other had assisted only in small mutual help groups (45.1%); a substantial number, however, committed family resources into both types of arrangement (28.6%). The commitment rarely involved more than one or two members of each family and was normally of very short duration. Thus two-thirds of the mutual help agreements lasted for less than five days and only seven were for more than ten days. In the case of 'longkhaek', comprising larger groups of families, over 20% of the cases lasted over ten days, with a heavy concentration in Ban Lao Yai. These characteristics are illustrated in Tables V-9a and V-9b.

These labour agreements are naturally concentrated into the two periods of transplanting and harvesting, with the particular emphasis on harvest time. The traditional social activity of 'longkhaek' is especially important at this time with two-thirds of the cases involved with harvesting and the subsequent threshing operation. Harvesting and threshing are the tasks for a similar proportion of the smaller mutual help networks, although in this case, work-groups for transplanting are of some significance. What is clear, however, is the overwhelming concentration on the traditional activities of farm life. Of those agreements not involved with paddy

TABLE V - 9b

Longkhaek Agreements: Period of Commitment, Lam Pao Villages 1971-72

VILLAGE	Days 1	2-3	4-5	6-10	11-20	20-100	Total Cases
	No. of Households						
BAN NA CHUAK NUEA	1	1	1	3	1	1	8
BAN TUM	3	-	1	3	2	2	11
BAN UM MAO	-	4	2	-	-	-	6
BAN FAI TAEK	-	-	-	-	-	-	-
BAN LEK	1	2	2	1	-	-	6
BAN NON SUNG	2	1	4	4	2	-	13
BAN LAO YAI	-	1	1	1	-	3	6
LAM PAO AREA	7	9	11	12	5	6	50

cultivation, there is only one case of work on other crops - a small 'longkhaek' group for kenaf retting in Ban Na Chuak Nuea. Most of the other cases are engaged in equally traditional activities, woodcutting, tending livestock, house-building and two rather interesting forms of communal activity, road construction and fishing. The latter, in Ban Non Sung, is a twice-yearly activity involving 20-30 families in a shallow lake near the village; the former followed a call by the headman to all families to help maintain the new road into Ban Tum. (Tables V-10a and V-10b).

The picture of labour networks from the suppliers' viewpoint is confirmed by the information gathered from recipient farmers. Here a slightly different piece of detail was sought, involving the farmers interviewed defining the source of their labour assistance. This showed that relatives were the most common source of help and in all 54 families (22.2% of the sample) had recourse to this source of aid. On the other hand, 37 families (15.2%) had received help from their friends and neighbours in the village, although of these 16 called upon both sources at some time during the year. The incidence of assistance by these two groups in the major processes of rice cultivation, however, differs quite significantly. As Table V-11 shows, whereas help by neighbours was overwhelmingly concentrated at harvest-time, when the larger 'longkhaek' arrangements are most important, assistance from relatives was more evenly spread, corresponding more closely to the more intimate assistance arrangements noted above. Once again it should be noted that the receipt of unpaid labour assistance is strongly polarised in rice cultivation. There were only 9 recorded cases where assistance

TABLE V - 10a

Mutual Help Networks: Purpose of Assistance, Lam Pao Villages 1971-72

VILLAGE	No. of Households					
	Harvest	T'plant	Thresh	Plough	Others	Total
BAN NA CHUAK NUEA	8	4	1	-	1	14
BAN TUM	7	9	2	1	1	20
BAN UM MAO	5	-	-	-	1	6
BAN FAI TAEK	2	1	-	-	-	3
BAN LEK	8	4	-	1	-	13
BAN NON SUNG	14	1	-	-	-	15
BAN LAO YAI	4	3	-	-	-	7
	48	22	3	2	3	78

TABLE V - 10b

Longkhaek Agreements: Purpose of Assistance, Lam Pao Villages 1971-72

No. of Households

VILLAGE	Harvest	T'plant	Thresh	Road Constn.	House Constn.	Others	Total
BAN NA CHUAK NUEA	8	2	1	-	2	2	15
BAN TUM	3	3	2	4	-	1	13
BAN UM MAO	6	-	-	-	-	-	6
BAN FAI TAEK	-	-	-	-	-	-	-
BAN LEK	6	-	-	-	-	-	6
BAN NON SUNG	13	1	1	-	-	1	16
BAN LAO YAI	6	-	2	-	-	-	8
	42	6	6	4	2	4	64

was received for kenaf cultivation, 3 for planting and 6 for cutting and associated processes. In each case help from relatives outnumbered that from neighbours by a ratio of two-to-one.

For some families in the Lam Pao area such labour assistance arrangements are extremely important in the successful completion of the various processes of the agricultural cycle. As Table V-12 shows, for a small number of families, relatives and neighbours provide over 30% of the total labour invested on the rice crop. It must be admitted, however, that such cases are exceptional and can be misleading. Two of the cases in which relatives helped to the extent of 30% of the total labour involved members of two families working together on the same plot; the case in which a neighbour's family contributed over 50% of the total labour was a case of true share-cropping. The typical contribution of supplementary unpaid labour is much smaller. In 57.4% of the cases of families helped by relatives, this assistance amounted to less than 10% of the total labour used; this was the case with some 67.6% of those households being helped by their neighbours. The typical situation seems to be one of temporary labour emergency rather than of chronic shortage.

The overall contribution of unpaid supplementary labour in the total labour inputs in rice cultivation in the Lam Pao area is a mere 4.9% of which relatives contribute 3.3% and neighbours 1.6%. In the cultivation of kenaf, their contribution is even smaller with only 1.8% of the total labour inputs. It would seem moreover that the use of such

TABLE V - 11

INCIDENCE OF HELP IN PADDY CULTIVATION BY SOURCE, LAM PAO AREA 1971-72

No. of Households

	T'plant only	T'plant & Harvest	Harvest only	Others	Total
Relatives	9	25	20	-	54
Neighbours	6	3	28	-	37
Hired Labour	16	14	7	14	51

TABLE V - 12

Percentage Contribution of Labour Assistance by Source, Lam Pao Households 1971-72

No. of Households

	0-5	5-10	10-20	20-30	30-40	40-50	50+	Total
Relatives	18	13	11	4	7	1	-	54
Neighbours	14	11	7	3	1	-	1	37
Hired Labour	13	9	11	3	6	6	3	51

supplementary labour is declining even for the traditional paddy crop; for other crops such arrangements have scarcely developed. Hired labour, on the other hand, appears to be growing in importance. In the 1970-71 crop season, 61 cases of use of hired labour on the farm were recorded; in 1971-72 some 86 cases were present. Tables V-13 and V-14 show the respective contribution by unpaid and hired non-household labour by process for the two main crops in the Lam Pao area for crop season 1971-72. Already hired labour is the single most important supplementary source in paddy cultivation and it is more significant than the other two sources put together for kenaf.

Hired Labour

For some of the villages in the Lam Pao sample survey, the contribution of hired labour is more important than the norm. If all crops are taken together, as in Table V-15. for the area as a whole hired labour contributes 11.14 mandays of total household labour inputs (5.9% of the total), whereas unpaid extra-household labour assistance adds another 10.29 mandays, amounting to 5.5% of the total average annual input of 187.99 mandays. The fact that certain villages record totals significantly above and below this average is difficult to explain. Two villages which have a low overall contribution from supplementary labour, Ban Tum and Ban Lek, have small paddy holdings, but many farmers there are engaged in kenaf cultivation. The village with the smallest holdings, Ban Fai Taek, by contrast has a high level of auxiliary labour input, second only to Ban Um Mao which has large paddy holdings

TABLE V - 13

Contribution of Labour from Various Sources to Individual Processes. Glutinous Rice 1971-72

Process	SOURCE				
	Household	Relatives	Neighbours	Hired	Total
	Mandays Per Rai				
1st Plough	2.12	-	-	0.06	2.18
2nd Plough	2.33	-	-	0.05	2.38
Seed Bed	0.98	-	-	-	0.98
Transplant	2.82	0.21	0.04	0.28	3.35
Weeding	0.41	-	-	-	0.41
Harvest	3.13	0.20	0.15	0.13	3.61
Total	11.79	0.41	0.19	0.52	12.91
%	91.32	3.17	1.47	4.02	

TABLE V - 14

Contribution of Labour From Various Sources to Individual Processes. Kenaf 1971-72

Process	SOURCE				
	Household	Relatives	Neighbours	Hired	Total
	MANDAYS PER RAI				
1st Plough	2.53	-	-	0.03	2.56
2nd Plough	0.76	-	-	-	0.76
Planting	2.90	0.04	0.03	0.01	2.98
Weeding	2.47	-	-	0.10	2.57
Harvest	6.07	0.09	0.10	0.42	6.68
Total	14.73	0.13	0.13	0.56	15.55
%	94.72	0.83	0.83	3.60	

Characteristics of Families Using Supplementary Labour

The possible distinction between those families making use of unpaid labour help and those using hired labour was felt worthy of greater examination. For this reason, the farmers of the 1971-72 sample were divided into four discrete groups, those using hired labour, those using supplementary labour from friends and relatives, those using both kinds and those relying purely on their own resources. The groups were compared over a range of selected socio-economic variables by means of a number of simple statistical tests and the results compared with a similar analysis of the previous year's data.

Table V-16 summarises the findings of a student's-T test carried out between the groups in question. It is certain that, whereas there may be particular cases in which an absolute shortage of labour or of male labour in particular may lead to the use of supplementary labour sources, this is not the major difference between the groups. Both hirers and users of supplementary unpaid labour have a lower average availability of male labour than those farmers whose family labour is sufficient, but even for hirers this difference is only significant at the 80% confidence level. What does stand out is that those using supplementary labour of any kind have larger holdings, particularly rice holdings, and have higher income levels, in terms of total value and of cash value, for crops and for rice in particular. These variables show differences significant at the 95% confidence level between hirers and families not using auxiliary labour,

TABLE V - 15

Average Contribution of Various Sources to Total Household Labour Inputs. Lam Pao Villages 1971-72

	MANDAYS						
	Household	%	Unpaid Non-Household	%	Hired	%	Total
BAN NA CHUAK NUEA	218.0	90.8	6.3	2.6	15.8	6.6	240.1
BAN TUM	181.7	94.2	4.2	2.2	7.0	3.6	192.9
BAN UM MAO	133.6	77.9	17.1	10.0	20.7	12.1	171.4
BAN FAI TAEK	115.3	80.0	13.3	9.2	15.5	10.8	144.1
BAN LEK	163.6	94.5	7.2	4.2	2.4	1.4	173.2
BAN NON SUNG	157.7	86.2	14.6	8.0	10.7	5.8	183.0
BAN LAO YAI	187.8	83.8	26.5	11.8	13.7	6.1	228.0
LAM PAO AREA	165.8	88.2	10.3	5.5	11.1	5.9	187.1

but at the same time the largest families. Perhaps the most significant grouping to emerge is the contrast between the four villages in the stage one irrigation area and the three most distant from the dam site. In Ban Na Chuak Nuea, Ban Tum, Ban Um Mao and Ban Fai Taek the use of hired labour is in excess of that of unpaid assistance. In the other three villages the situation is reversed. Such a contrast might be said to correspond to a greater commercialisation in the more northerly villages.

The direction of use of hired labour by the farm households of the Lam Pao area is similar to the use of unpaid help and yet at the same time complements it. Much more use is made of hired labour on the less traditional kenaf crop than is made of unpaid help, although it only accounts for 3.6% of the total inputs. Hired labour in paddy cultivation is used more often for ploughing than is unpaid labour and shows a higher incidence in transplanting than in harvesting. (Table V-11). The complementary pattern is further emphasised by the fact that of the 51 cases of hire of labour for paddy cultivation, only 36% also make use of the unpaid labour agreements. One further distinction which may be made between the two sources is that the number of farmers making heavy use of hired labour is much higher than for the mutual-help agreements. Some 29.4% of households hiring make use of the hired labour to the extent of more than 30% of their total labour use, whereas such cases are much rarer in the assistance of relatives and neighbours.

TABLE V - 16

Characteristics of Labour Hiring Families, Families Using Supplementary Unpaid Labour and Others
Bam Pao Survey 1971-72

Variable	Non-Users Mean Value (1)	Hirers Mean Value (2)	Unpaid Supplementary Mean Value (3)	Hiring + Unpaid Mean Value (4)	T-Values (1)-(2)	(1)-(3)	(1)-(4)	(2)-(3)	(2)-(4)	(3)-(4)
Family Size	6.7	6.7	6.6	6.6	-0.02	0.19	0.24	0.17	0.22	0.06
Male Labour Force	1.8	1.5	1.6	1.9	1.55*	1.22	-0.28	-0.25	-1.12	-0.95
Size of Holding	14.9	19.7	19.0	24.6	-2.24**	-2.09**	-2.89+	0.25	-1.33*	-1.54*
Rice Holding	12.0	15.8	16.1	20.5	-2.05**	-2.40**	-2.73***	-0.12	-1.37*	-1.33*
Total Income	5484	7905	6214	8336	-2.32**	-1.00	-2.08**	1.46*	-0.26	-1.46*
Cash Income	3561	5488	4041	5481	-2.14**	-0.70	-1.57*	-1.41*	0.00	-1.09
Income from Crops	2886	4031	3302	4622	-2.39**	-1.52*	-2.88+	1.50*	-0.81	-2.16**
Income from Rice	2143	2824	2453	3595	-2.21**	-1.47*	-2.75***	1.13	-1.23	-2.07**
Income from Kenaf	628	970	691	747	-1.48*	-0.38	-0.42	1.17	0.67	-0.20
Off-Farm Income	1475	1902	1324	1618	-0.65	0.25	-0.22	0.78	0.36	-0.40
No. Days Work Off-Farm	73	90	58	90	-0.50	0.58	-0.44	1.08	0.01	-0.93
% Rice Sold	9.6	17.1	10.9	15.8	-2.07**	0.81	-1.32*	1.51*	0.23	-0.74

* Significant at 80% Confidence Level
** Significant at 95% Confidence Level
*** Significant at 98% Confidence Level
\+ Significant at 99% Confidence Level

but the contrast between non-users and those using supplementary unpaid labour is less significant. Only the total size of holding and the size of holding in rice are significant at the 95% level, with crop income and rice income falling to the non-acceptable 80%.

This contrast suggests probable differences between families hiring and those only making use of non-family unpaid labour. Income levels, both in terms of cash and value are on average higher for hirers than for other users and the difference between users and non-users in total income and cash income levels is scarcely significant. This indicates, perhaps, that those families hiring labour might be the richer section of the population and indeed the more commercialised section. Although there are no notable differences in the size of kenaf holdings or of income gained from kenaf, the proportion of paddy sold is higher than for users of unpaid assistance. If these two groups are compared, however, it will be noticed that these differences are significant only at the 80% confidence level, so that although it may be said that the use of hired labour indicates greater commercialisation, whereas the mutual help networks still assist those who are more tradition-bound, this should not be overstated.

The analysis for the previous year, however, shows the same trends much more clearly. Here families hiring labour were compared with all others whether or not they used supplementary labour.[37] As Table V-17 shows, a number of differences in mean were highly significant, with hirers

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37. On the grounds that the contribution of unpaid supplementary labour was not recorded in that year.

TABLE V - 17

Characteristics of Labour Hiring Families & Non-Hirers 1970-71

Variable	Hirers Mean Value	Non-Hirers Mean-Value	'T'-Value	Significance Level
Savings Level	3005	23	3.78	99.9
Total Income	8065	5200	3.52	99.9
Cash Income	6149	3470	3.43	99.9
% Crop Income	49	64	- 3.18	99.9
% Off-Farm Income	31	16	3.14	99.9
Off-Farm Income	3238	1291	2.96	99.9
Crop Value	3473	2679	2.42	98.0
Income from Kenaf	1347	755	2.20	98.0
Size of Holding	18.9	15.9	1.84	95.0
No.Absentees in Household	0.4	0.2	1.82	95.0
Rice Holding	15.6	12.9	1.80	95.0
% Income from Remittances	8	3	1.79	95.0

having higher total and cash income levels and higher income from off-farm sources. Again indications of greater commercialisation were present, in terms of very much larger cash inputs per rai on rice and on kenaf (although partly a function of the cash spent on hired labour) and of higher income from kenaf.

If such are the characteristics of the households hiring-in labour, some note should be taken of the sources from which such labour is obtained. It seems clear that these are not generally found within the villages of the Lam Pao sample survey, for the converse questions concerning labour contributions outside the family farm revealed only 24 cases of agricultural wage labouring in 1971-72. Such families as did go out on such work were normally the newer, less well-established families with little rice land of their own. In such circumstances wages would quite commonly be given in rice, although among families hiring-in only four cases of payment in rice were recorded in 1971-72.[38]

It would appear certain that the major sources of agricultural wage labour used in the villages of the Lam Pao project are the upland villages outside the irrigation area. Here deprivation caused by crop loss has been more widespread even in pre-irrigation days. Land is widely available on the upland, but poor, permeable soils mean that it is often too dry to work. Farmers from such villages seek to ensure their subsistence livelihood by wage labouring for rice or for cash to buy rice in the more favoured lowland areas. The likely availability of such labour is widely known in the lowland and a farmer with a large holding will travel into the area to enlist labour on a casual basis at the season it is

38. Where a greater degree of crop loss is experienced, then labouring for wages in kind is accustomed to increase.

required. The contractor may even send transport to collect the men each morning if the villages are far apart.

When conditions are favourable for the farmers in the upland to plant their own paddy land, then demand from the lower areas may exceed supply in the immediate surrounds of the Lam Pao project. In such circumstances recourse may be made further afield and evidence has been noted of movement of workers from the neighbouring province of Mahasarakham. Farmers in Lam Pao comment that the greater incidence of landless families in the densely populated changwat Mahasarakham means that labour from there is cheaper than it is in Kalasin. Commonly labourers coming from such distances move in with the hiring family for the season and their wages include daily subsistence.[39]

Problems of Labour Use

Examination of the use of non-household labour resources has demonstrated that there are still, despite the falling size of holding and the growth of the available labour force, definite crises of labour shortage during the farm year. Traditionally these have been solved by the more or less informal mutual help networks existing between friends and relatives in the village and in the past these have been more than adequate. Today this is not the case and the use of hired labour has become sufficiently important to make an overall greater contribution to farm labour inputs. Farmers themselves admit that the traditional help networks

39. In terms of payment for wage labour in general, practices seem to vary with regard to the daily subsistence of the labourers. Some hiring families provide a midday meal, others expect the labourers to bring their own food.

have been becoming less frequently used than in the past.[40]

It may be said that two factors have affected the traditional pattern, to both of which allusion has previously been made. The widespread adoption of semi-improved rice varieties has replaced the myriad local strains which were to be found in the Northeast. In the traditional system, farmers planted a number of different seed types to help overcome the harvest bottleneck and thus the harvest period, with its communal activity was able to extend over a longer period. Today the harvest has been concentrated through the adoption of standard varieties; the 'longkhaek' networks have not proved adequate and hired labour has been sought outside the village, especially by richer farmers.

The failure of the labour networks is compounded by the adoption of the new upland crops. It was possible to run such assistance networks while all farmers were engaged in the same operations. Today in the Lam Pao area, 60% of farmers have added kenaf to their paddy rice staple, while a few others are cultivating cassava. These crops are additions to the old system and because not all farmers are engaged in their cultivation the old system has tended to break down. It has already been shown that extra labour inputs into the major cash crop of the Lam Pao area have been in the form of hired labour rather than from traditional sources. It is

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40. The Lam Pao sample survey in 1974-75 crop season specifically asked farmers whether the extent of use of 'longkhaek' arrangements and of hired labour had changed in the previous five years. In the three villages of Ban Na Chuak Nuea, Ban Tum and Ban Um Mao, 56.8% of farmers felt 'longkhaek' had declined, while only 6.5% said it had increased. By contrast 60.0% felt hired labour use had increased, only 1.3% that it had declined. Others expressed no change.

probable that, where farmers are engaged in kenaf cultivation with any real commitment, they will also be unable to supply labour to their fellows who desire assistance with their rice.

The cultivation of kenaf has brought a growing individuality amongst farmers of the Lam Pao irrigation project area, producing an increasing cash investment in agriculture through the use of hired labour. If this is the result of the introduction of one new crop, it seems likely that further diversification under the new irrigation regime will produce a further movement towards purchase of labour. Individual farmers will follow their separate enterprises and, as Moerman notes

> "The wages paid to planters really buy, not leisure, but release from community obligations that would interfere with the pursuit of money." 41

The development of irrigation system in itself implies an immediate increased demand for labour inputs, with the new responsibility of farmers as a group to provide labour for farm ditch maintenance work. Every farmer is partly responsible for the repair of the farm turn-outs and ditches on which his own land is situated and is organised by the irrigation ditch-rider to provide labour when necessary. The amount of extra labour that this entails varies according to the work to be done. According to Frutchey, working at the Mae Faek project in the Northern region of Thailand, the work required to ensure a dry season irrigation capability is rather greater than that for wet season supplementary

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41. Moerman,M., op.cit., p.134.

irrigation alone.[42] She notes that the current average labour input per farm family in the Mae Faek project to be in the order of 23 mandays per year on canal maintenance tasks.[43] At present the maintenance requirements of farm families in the Lam Pao project certainly do not approach this level, although it is clear that some of farmers' future tasks were still being carried out by irrigation department officials. The farmers themselves certainly did not see their duties as onerous.[44]

It was clear that at the Mae Faek some farmers may have found the actual time assigned for the canal and ditch repair inconvenient and that these had made up their contribution by hiring labour. Nevertheless, this aspect of increased labour demand with irrigation is likely to be rather insignificant compared with other considerations. While irrigation facilities help farmers to broaden the base of their agricultural activity, they equally impose a certain discipline on the farmers involved. Farmers are able to receive water only at particular times when their turn on the water rota comes up. This means that any agricultural activities dependent on the receipt of water must be carefully regulated. Although farmers in a particular farm ditch will themselves receive water in turn, those with land in close proximity to one another, often relatives, are likely to receive their water

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42. Frutchey, Rose H., "Socio-economic Observation Study of Existing Irrigation Projects in Thailand", USOM, Bangkok 1969, p.64.

43. Ibid., p.66.

44. Although when it came to the repair of turn-out 3 in Ban Na Chuak Nuea in 1974, farmers were in dispute with the Royal Irrigation Department over responsibility for repair. But see below, Chapter VIII.

at approximately the same time and consequently will have little spare labour to help one another. Where only supplementary irrigation is involved it is only at an arranged date that the irrigation authorities will begin to transmit water through the system. Farm activity is held up until this time, thus resembling the start of the monsoon in its effect.

Where multiple cropping under irrigation is envisaged, the problem of regulation becomes even more formidable. Unless farmers have a carefully designed system of field ditches whereby each can take the water as and when he desires, they must all time their enterprises to coincide with the regime allowed by the supply of water. A farmer who falls behind in harvesting a first crop may be in danger of not completing this process before water arrives for his fellows to re-plough their land for a second crop. The premium on completion may require him to work at a rate above that possible through utilising his own household resources alone. His neighbours will be preparing for the new crop. Hire of labour is the only likely solution.[45]

The problem of second-cropping raises, moreover, a much more fundamental point. To date the dry season has been very much a time of renewal for the farmers of the Northeast. It is in this season that they traditionally carry out repairs to equipment or to their living quarters and engage in such supplementary activities as fishing or making craft

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45. In Lam Pao in 1975 farmers in Ban Kham Maet were faced with a similar problem in harvesting their second crop rice. Water supplies for the main season crop were due on June 15th; those who had not finished harvesting were rushing to meet this deadline and most had hired labour to help.

products. It is also a season of leisure, the time for weddings and other festivities.[46] In the last decade, however, the dry season has become something more. As communications have improved and contact has been made easier with both the local market centre and with other regions, the Northeastern villager has been found with a greater range of attractive consumer goods. He has been encouraged to seek an additional source of cash income, usually through off-farm employment.

Off-farm Labour

Although in the Lam Pao area there are a number of farm families with members who have taken up fulltime employment outside agriculture as guards at the irrigation construction site, tractor-drivers or the like, for most farm families off-farm employment is still casual and highly seasonal. In the sample survey of 1971-72, 136 cases of persons obtaining income from non-farm activities were recorded.[47] A small number of cases involved money-lending which took up a minimal amount of time. Of the remainder, 132 cases, the majority were engaged in casual labouring (70.5%) with only a small proportion in regular salaried employment or employed as skilled labourers. These categories included government officials, teachers, irrigation project guards, village headmen and their deputies and self-employed carpenters and painters. A few individuals also spent time in trading activities, usually on a part-time basis (Table V-18).

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46. See above Chapter III.

47. The 1971-72 survey involved a more detailed breakdown of activities than in the previous year.

TABLE V - 18

Distribution of Off-Farm Activities, Lam Pao Household by Village 1971-72

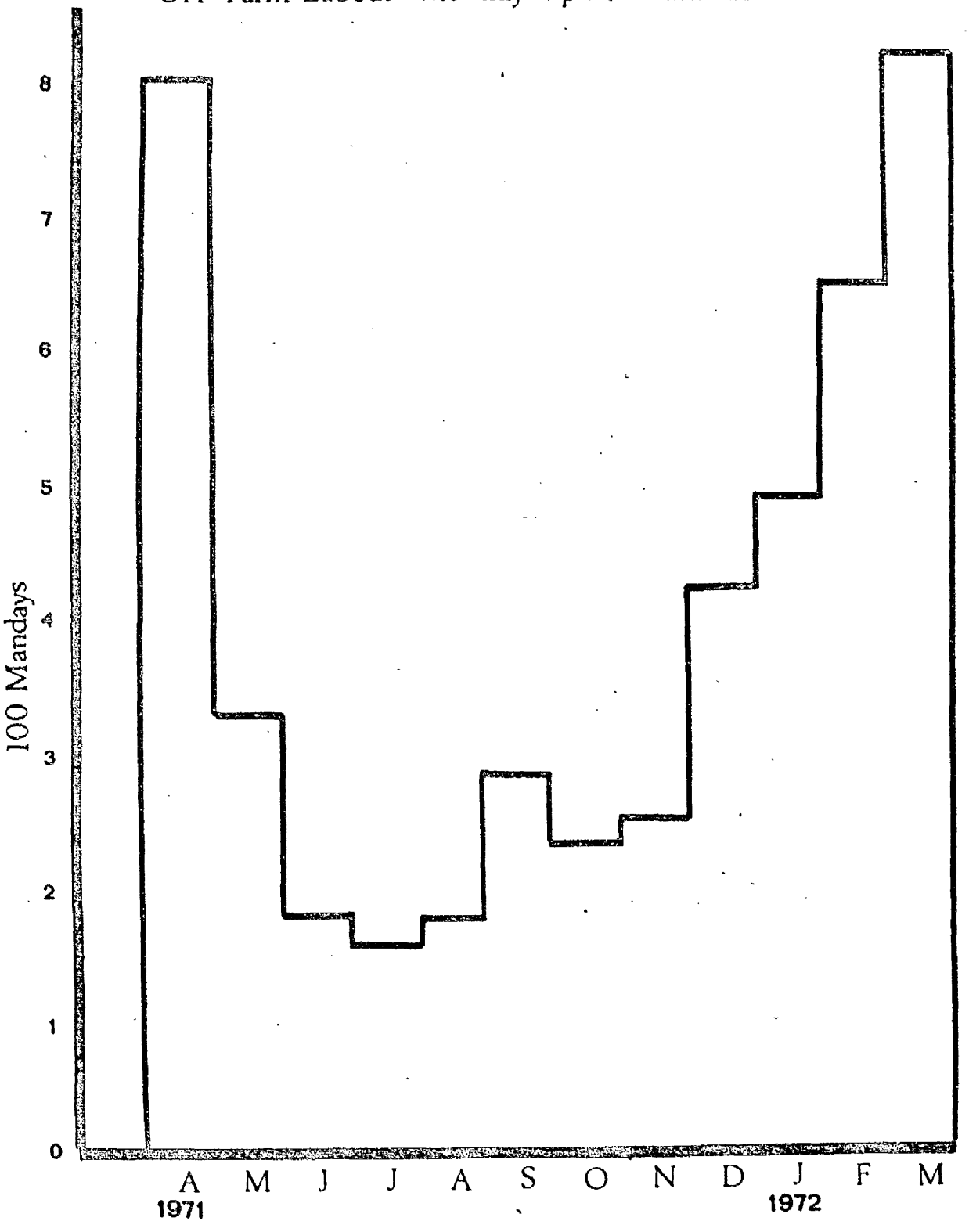
	No. of Households				
	Wage Labour	Trading	Official & Skilled	Others	Total
BAN NA CHUAK NUEA	12	-	4	7	23
BAN TUM	19	8	-	6	33
BAN UM MAO	15	1	2	1	19
BAN FAI TAEK	11	1	-	3	15
BAN LEK	25	-	-	-	25
BAN NON SUNG	8	2	-	3	13
BAN LAO YAI	3	-	-	1	4
TOTAL	93	12	6	21	132

The activities recorded in the category of wage labouring varied extensively from house construction and wood-cutting, through employment at rice mills to road and canal construction. Most were carried out locally, either in the individual's own village or in the adjacent district centre (amphur). A number of people sought work in Kalasin town, while a few moved further afield to work in Khonkaen or Bangkok (chiefly painters from Ban Lek) or as 'samlor' (trishaw) drivers in the better paid locations of Nakorn Phanom and Khorat, both the site of United States' Air Force bases. Even with such people, however, these activities were highly seasonal and did not constitute regular employment. Of course the monsoonal rainfall regime governs to a certain extent the seasonal availability of some jobs. Activities such as charcoal-burning cannot be carried out in the rains, which also cause major government work of construction, both on canals and roads, to come to a halt in the wet season. Farmers are thus able to obtain work off the farm when work on the farm is at its lightest. Figure V-7 shows the distribution of off-farm labour by month for the households of the Lam Pao sample survey. It is clear that there is a notable peak in the months of March and April, falling off sharply as soon as the period of the main on-farm work begins.

Although the Lam Pao sample survey did not quantify this point, observation suggests that the majority of those engaged in off-farm employment, like those who are working permanently away from home, are the younger male section of the farm population. As was suggested in Chapter IV, these people have to wait for a long time to have any say in farm decisions, especially where the household head is male.

FIGURE V-7

Off-Farm Labour : Monthly Inputs : Lam Pao Area



On the other hand, it is this section of the community which is most susceptible to the temptations offered by new consumer goods and which is probably most desirous of obtaining an independent source of cash income. Although some young families have been able to develop land for upland cultivation and others have their own small rice plots, for them wage employment has a strong attraction. The average rate of pay recorded for wage labouring in the Lam Pao sample survey was 15.9 baht per day, corresponding closely to the rates paid both by the Highways Department for road maintenance work and by the Royal Irrigation Department for canal digging and similar tasks. It is significantly lower than the rate paid by the latter to those persons who work as guards at the dam site and other construction camps for which the standard rate of pay in 1971-72 was 22.6 baht per day. This rose to 26 baht in 1972-73.

Agriculture in the area is hard pressed to match these returns, although its competitiveness varies from year to year with price changes. Kenaf has in fact matched the wage levels. In 1970-71, with an average price of 2.05 baht per kilogramme and an average yield of 160 kilogrammes per rai, kenaf gave a return of 25.3 baht per manday. It is clear, though, that kenaf yields are not being maintained in the area and in 1971-72 the return per manday fell to only 22.6 baht, despite a higher average price, as a result of a decline in yield to only 115 kilogrammes per rai.

Kenaf, moreover, is now a well established crop with adequate marketing channels which requires relatively little investment for successful cultivation. It is also grown in the wet season when competition from off-farm labouring

opportunities is less. It appears probable that the new crops introduced for dry season cropping in the area, like maize, peanuts and soyabean, will require a greater investment of time and money than does kenaf. In order to seem attractive to those with opportunities of wage labour, these new crops will have to offer returns compensating for the extra investment and higher than to be gained from off-farm labour. If this is not the case, the younger members of the farm household may prefer to remain off the farm in the dry season, denying their labour to the household as a whole and prejudicing efforts at second cropping without the additional expenses of hired labour.

Labour in Second Cropping

By the end of the 1972 crop season, the development of second cropping in the Lam Pao irrigation area had not progressed very far. Although little of the area scheduled had actually received dry season irrigation water, where this was present the commitment to the new enterprise was certainly half-hearted and the returns had not shown themselves sufficient to bring about a firmer attachment. The total labour input into second cropping in the sample survey of 1971-72 amounted to no more than 2.22 mandays per farm family, representing only 1.18% of the total labour used. Most of this was invested in Ban Na Chuak Nuea, where 17 families (45.9% of the village sample) were growing cucumbers, as well as a variety of other crops, albeit on a very small scale. The scale of the enterprise typified the strength of the commitment and this was confirmed by the nature of the

labour input. Pilgrim reported that in the 1970 dry season

> "..some eighty persons (were) reported as taking part in a cucumber production programme,...women providing the main labour and taking the profits." 48

Personal observation indicates that the situation had not changed markedly since that time; the women treat the enterprise as providing a useful supplementary income, while men continue to find dry season employment off the farm.

It is, as yet early to assess the adequacy of existing labour supplies for expanded dry season cropping at Lam Pao, but a comparison with the developing irrigation system at Lam Phra Phlerng in Nakorn Ratchasima suggests that, whether as a result of competition from off-farm employment or as a consequence of the need to carry out farm operations rapidly, the development of irrigation and of double cropping will put pressure on labour resources. A survey carried out covering crop season 1972-73 noted that 23.45% of cash expenditure on agriculture was made for the purpose of hiring labour, (cf. Lam Pao, only 4.1%) while one-fifth of the total labour inputs made by the average farm family were of hired labour (Lam Pao, only 5.9% in 1971-72).[49] Table V-19 indicates the extent of its use.

The use of hired labour to such a degree has not been exclusively as a result of second cropping. As Table V-19 shows, labour was hired extensively both by those engaging

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48. Pilgrim, J.W., "Social Planning for Rural Development", Bangkok 1972, Draft, pp.82, 92.

49. Ng, R.C.Y., H.Demaine and C.J.Dixon "A Report on the Introduction of Dry Season Cropping in the Lam Phra Phlerng Irrigation Project Area", Field Report for I.B.R.D., London 1973, mimeo.

TABLE V - 19

Hiring of Labour, Lam Phra Phlerng 1972-73

MONTH	TOTAL SAMPLE		SECOND CROPPERS		NON-CROPPERS	
	% Hiring	Mandays	% Hiring	Mandays	% Hiring	Mandays
April 1972	3.37	435	2.31	179	6.17	256
May	2.69	408	1.39	152	6.17	256
June	8.75	1159	8.33	534	9.87	635
July	27.61	3190	26.85	2222	29.63	968
August	14.81	1349	12.96	837	19.75	512
September	2.69	162	2.31	97	3.70	65
October	1.68	111	0.46	39	4.94	72
November	4.71	787	4.17	277	6.17	510
December	26.60	3467	25.93	2124	28.40	1344
January 1973	21.55	2439	19.44	1553	27.16	886
February	10.44	1044	11.11	922	8.64	122
March	9.76	508	13.42	508	-	-
All 12 months	1.01	1100	1.39	1100	-	-
		16160		10534		5626

Source: I.B.R.D. Sample Survey 1973

in second cropping and by non-participants. Only by March 1973, as second cropping began in earnest, was there any notable difference between the two groups, with 13.4% of croppers finding it necessary to hire for their new enterprise. On the other hand, the disciplines imposed by the irrigation system which had been providing supplementary wet season irrigation for a number of years seemed also to have been felt. The report notes

> "...many of the farmers have found themselves in both the wet season and the dry season, having to complete processes dependent on irrigation water in a relatively short space of time instead of the leisurely pace that they were accustomed." 50

Ng has also noticed these trends in a recent report on the Experimental and Demonstration Farm at Huay Sithon. He notes a discernible trend towards hiring by second-cropping families at the beginning of the second crop harvest season in April,[51] as well as an increase in use of hired labour over the period of main season harvesting in October-December. In the case of second croppers hired labour accounts for 21.68% of total labour needs at this time.[52]

It cannot be denied that some of the increased demand for hired labour in Lam Phra Phlerng was the result of organisational problems in the irrigation system, but this is only part of the story. The main advantage of irrigation water is to offset unreliable water supply and make water available for dry-season cultivation. As was pointed out above, it does

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50. Ibid., pp.41-42.

51. Ng,R.C.Y., "Socio-Economic Changes Under the Impact of Irrigation in the Huay Sithon Project Area", Report for F.A.O., London, 1974, mimeograph, pp.93-95.

52. Ibid., p.95 and Tables 27, p.97 and 28, p.100.

not necessarily extend the period available for completion of the various processes of cultivation. This is particularly the case where farmers receive water in strict rotation and where irrigation is only one element in a package of measures for improving productivity. Then there is a need to co-ordinate the assembly of the different inputs required for successful cultivation. In rice cultivation, seedlings, water supply, fertiliser and labour should be brought together for the transplanting process and ploughing and harrowing should be done beforehand. Intensity of cultivation may indeed be required to increase and this may equally be the case with harvesting in order to leave adequate time for preparation for the new crop. These problems are equally represented in the increased use of hired labour in Lam Phra Phlerng.

To date the second cropping at Lam Phra Phlerng, while corporately impressive, has been on a small scale on an individual basis. It is therefore justifiable to assume that, as this expands, so too will the need to supplement household labour resources on a larger scale, whether or not the dry season crop remains dominated by irrigated paddy and peanuts as recorded at the time of the survey. The United States Bureau of Reclamation have estimated that, in a year-round cropping pattern, the need to hire labour will increase rapidly, at least for the standard 4-hectare farm which they are considering.[53] Table V-20 gives their estimated labour requirements for such a farm, with hired labour contributing a total of 158 mandays

53. United States Bureau of Reclamation, "Pa Mong Stage 1 Feasibility Report. Appendix VI: Agricultural, Social and Financial Analysis". Bangkok 1970, p.III-28.

TABLE V - 20

Estimated Monthly Labour Inputs Required
for 25 rai farm. Year-Round Cropping Pattern

Month	Operator	Family	Hired	Total
January	25.89	21.45	8.00	55.34
February	19.87	2.88	-	22.75
March	20.91	3.70	-	24.61
April	25.80	22.20	21.00	69.00
May	26.50	22.74	50.00	99.24
June	24.52	21.10	9.00	54.62
July	23.50	21.47	7.00	51.97
August	14.51	-	-	14.51
September	15.32	-	-	15.32
October	24.87	22.47	12.00	59.34
November	23.68	21.54	6.00	51.22
December	26.50	22.39	45.00	93.89
Total	271.87	181.94	158.00	611.81

Source: United States Bureau of Reclamation
Pa Mong Stage 1 Feasibility Report: Appendix VI Economic, Agricultural, Social and Financial Analysis, 1970
Table III - 7, p. III - 29.

to the enterprise. The size of the farm is rather larger than those currently operating at both Lam Pao and at Lam Phra Phlerng. In the former the current size is nearer 3 hectares, whilst in Lam Phra Phlerng the average size is 24 rai or 3.85 hectares.[54] For a smaller holding, it is justifiable to assume that it will be the hired labour that is first dispensed with and that for many farmers it will not be necessary. However, it has been shown above that, despite ample resources of labour in the typical farm family, crises do occur in the farm year and that in the dry season even the labour normally available cannot be relied upon. A substantial increase in the hiring of labour seems a likely requirement for future diversified cropping under irrigation.

The discussion in this chapter has sought to assess the adequacy of labour resources in the irrigation projects of Northeast Thailand for the new developments offered by irrigation. The general conclusion has been that, whereas for most of the year the family labour is adequate, at certain times crises are encountered. Traditionally these have been solved by mutual help labour arrangements between village neighbours, but as new enterprises are undertaken these are breaking down and hired labour is increasingly being sought to supplement family resources. The hire of labour seems destined to increase as irrigated cropping, particularly dry season cropping, develops. On the other hand, these conclusions must be qualified to some extent. As was noted above, the average size of holding would appear to be on a downward trend which should reduce overall labour requirements per farm family. Again the possibility of mechanisation with

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54. Ng et al., op.cit., p.19.

its capacity for saving labour should not be overlooked.

These considerations deserve some attention. They do not necessarily negate the conclusions drawn earlier, especially if the former proposal is placed in the context of a declining birthrate. It may be that the average size of farm will be reduced, but, at the same time, it is likely that the intensity of work on that farm will increase. There are still likely to be crises of labour needs with which available household labour cannot cope, especially on the larger commercial holdings. As to mechanisation, the questions remain over whether this is practicable in the circumstances of Southeast Asian agriculture, whether it is desirable and whether, indeed, it does reduce labour inputs. Tractors may be useful in speeding up the ploughing process and easing the rush periods between crops, but they require maintenance and investment. For other processes, efficient machines have yet to be found, especially for rice cultivation. Moreover, the labour crises in Southeast Asian agriculture, particularly in irrigated areas, are not so much crises of labour shortage per se, but rather of pressure on time available to complete the task. With increasing labour resources likely to be available, labour hire is preferable to machinery hire.

For all the qualifications, therefore, it does seem likely that the change to irrigated agriculture will increase the need for supplementary labour resources to be hired. Whether mechanisation is introduced for any process, the net result will be similar, for hire of labour will represent a large increase in cash investment in agriculture. At the present time such an investment would leave many farmers

with a problem of where to obtain the cash resources. It is true that the larger farmers will be most likely to need to make this investment and will equally be most capable of making it. They will thus be better able to take advantage fully of the irrigation facilities. Smaller farmers' needs may be less frequent and less extensive, but they are also less likely to be able to cope when the need does arise. Like the other inputs of the new agriculture, supplementary labour requires funds which the farmer may not have to hand. Credit facilities are available but these may not be adequate for the satisfaction of all. The state of the credit market in the Lam Pao irrigation area of Northeast Thailand will be examined in the next chapter.

CHAPTER VI

TRADITIONAL SOURCES OF CAPITAL IN THE LAM PAO AREA

Under conditions of subsistence agriculture, the factors of production considered in the last two chapters, land and labour, are dominant. As Clark notes

> "...the earliest stages of agriculture call for little input of labour and none of capital, apart from the production or purchase of axes." 1

As agriculture develops, so the need for increased labour inputs and eventually capital inputs grows rapidly. Labour is in relatively large supply, but at each successive level of technology, there comes a time when such labour fails to give any further return on increased investment.[2] A change in technique is needed to allow for the cultivation of larger areas of land or for intensification of production on the same land resources. Clark traces the development of agriculture from the use of the dibble stick, through hoe cultivation to the use of the plough drawn by animal power - each stage calling for greater investment of labour and capital than the one before and each enabling men to live at a greater density of population.[3] The same author suggests that

> "It is rapid population growth which is the principal motive force bringing about, at certain times of history, extensive

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1. Clark, C., "Population Growth and Land Use", London 1967, p.134.

2. See above, Chapter V and Clark,C. and Haswell M.R. "The Economics of Subsistence Agriculture", Londnn 1964, pp. 103ff.

3. Clark,C., op.cit., p.134.

> clearings of uncultivated land, drainage of swamps, introduction of improved crops and manures, and the like." 4

Even under a system of sedentary lowland cultivation, the use of capital inputs in agriculture is very limited, their major form being what Myint terms

> "..circulating capital of the 'subsistence fund' of food and consumers' goods." 5

In the Southeast Asian context, this 'subsistence fund' would consist of a store of grain for household consumption and for seed for the following year, of water buffalo and oxen for preparation of the fields and for haulage, and of a limited range of agricultural implements like the wooden plough, wooden harrow, the hoe, sickle carrying pole and a pestle and mortar for rice milling. Apart from this, most farmers would own a selection of household goods, like water pots, weaving frames or looms and spinning wheels. All of these, with the exception of the limited metal parts, the farmer has usually been capable of making himself.[6]

Materials such as these were all the family needed, except on special occasions; then, perhaps, a small amount of grain or some handicraft might be exchanged for a good or service provided by a neighbour. With his plough and buffalo a farmer would be capable of working an area in excess of his subsistence needs, but normally he chose not to do so, as Myint notes,

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4. Ibid., p.137.

5. Myint, Hla, "The Economics of the Developing Countries", London 1964, p.39.

6. Ingersoll,J., "Human Dimensions of Mekong River Basin Development. A Case Study of the Nam Pong Project, Northeast Thailand 1967-68", Washington 1968, p.76.

> "..for the simple reason that every other peasant family would do the same and there would be no-one in the locality who would want to buy the surplus output." 7

When commercialisation began to penetrate this traditional system, moreover, it was the existence of a considerable margin of surplus productive capacity in the form of both surplus land and surplus labour over and above their minimum subsistence requirements, which gave farmers the chance to rapidly enter the export economy.[8] There was, initially, no need for new capital investment on the part of the farmer and, as Myint points out

> "..the peasant export sector seems to be simply an extension of the traditional economic organisation and technology of the subsistence economy." 9

This was certainly the case in Southeast Asia, particularly in Burma, Thailand and the Mekong Delta, where the traditional subsistence economy was developed by traditional methods for the export market. As was noted in Chapter II, the area planted under rice in Thailand increased rapidly after 1850.[10] The extension of paddy cultivation required little money expenditure by cultivators. The land was free to anybody who could clear and cultivate it. The commercialised farmers used mainly the same tools and techniques as those who remained purely subsistent. Their

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7. Myint, op.cit., p.43.

8. It should be noted, however, as demonstrated in Chapter IV, that farmers in Northeast Thailand normally planted more land than was required for subsistence to make up for any possible crop loss.

9. Myint, op.cit., p.40.

10. See also Figure II-1.

only increase in investment was in land and labour. Ingram estimates that

> "..the capital expenditures required to cultivate 20 rai of land in rice would have been about equal to only one year's money income...Even at interest rates of 30 to 50 percent, the new farmer should have been able to repay money he borrowed to begin farming." 11

This extension of the cultivated area cannot be a permanent feature and indeed, it was pointed out that in Thailand such an expansion overreached itself by taking into cultivation much marginal land. In recent years, expansion of the cultivated area under paddy has slowed down and the rapid increase in population has put pressure on the traditional methods of paddy cultivation. These have proved capable of responding to the need for increased production to only a limited extent. Changes in technology have been seen to be required, changes which demand an increase in capital investment to pay for new varieties of seed, chemical fertilisers and pesticides, farm machinery, and, as noted in the previous chapter, hire of labour.

The need for greater capital investment on the part of the individual farmer means a substantial change in the management of his resources. His problem is one of obtaining the capital necessary to make these investments, the search for which involves new ventures and new risks. Basically he has three possible sources for this capital. He may finance new investments out of his own capital savings; he may seek capital elsewhere through developing new enterprises; he may have to borrow capital from other sources.

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11. Ingram,J.C., "Economic Change in Thailand 1850-1970" Stanford 1971, p.65.

TABLE VI - 1

Cash Inputs into Glutinous Rice

Lam Pao Villages 1970-1

	Cash Input (Baht)							
	0	0-50	50-100	100-150	150-200	200-250	250-500	500+
	No. Cases							
BAN NA CHUAK NUEA	22	5	2	1	1	2	1	1
BAN TUM	17	4	7	7	3	5	7	7
BAN UM MAO	6	-	-	3	2	5	11	8
BAN FAI TAEK	8	3	1	2	3	3	3	2
BAN LEK	12	1	4	5	3	4	12	1
BAN NON SUNG	5	1	1	9	1	7	6	3
BAN LAO YAI	11	-	-	-	-	-	-	-
LAM PAO TOTAL	81	14	15	27	13	26	40	22
% LAM PAO TOTAL	34.0	5.9	6.3	11.3	5.5	10.9	16.8	9.2

At present the level of cash investment on the farm by farmers in Northeast Thailand is generally very low. According to the findings of the Lam Pao land use survey for the crop season 1970-71, 34% of the farmers did not spend any money in the cultivation of the principal and staple food crop, glutinous rice. For another 29%, the level of investment was less than 200 baht. As has previously been noted, commitment to the other major crop in the area, kenaf, was insufficient to lead more than a handful of farmers to invest cash resources in kenaf cultivation. Of the 141 farmers growing kenaf, only 26 (18.4%) were prepared to commit cash resources in its cultivation and only 11 (7.8%) used over 200 baht in the process. (Tables VI-1 and VI-2).

This low level of cash investment in annual crop production has two possible explanations. Either the farmers are not prepared to use valuable cash resources on risky agricultural enterprises or they are not actually in a position to invest in agriculture. Although, as we have seen above, the former situation is a very important consideration for many farmers in the unreliable environment of the Northeast, the latter problem does also seem to afflict many farm households. What evidence is available suggests that a certain proportion of farmers are not in any position to finance farm production activities themselves.

An assessment of the position of the Northeast farm family in terms of liquid capital assets is fraught with difficulties. As has been shown earlier, the farm families of the Lam Pao sample survey in 1970-71 recorded a total average income of 5934 baht, which includes a cash component of some

TABLE VI - 2

Cash Inputs Into Kenaf

Lam Pao Villages 1970-1

	Cash Input (Baht)					
	0	0-100	100-200	200-300	300-400	400+
	No. Cases					
BAN NA CHUAK NUEA	14	2	-	-	-	2
BAN TUM	38	6	1	2	2	2
BAN UM MAO	7	1	2	-	-	-
BAN FAI TAEK	10	-	-	-	-	-
BAN LEK	15	1	-	1	-	1
BAN NON SUNG	22	1	2	-	-	-
BAN LAO YAI	9	-	-	-	-	-
LAM PAO TOTAL	115	11	5	3	2	5
% LAM PAO TOTAL	81.6	7.8	3.6	2.1	1.4	3.6

4157 baht. Time available for survey operations unfortunately precluded an investigation of the overall household expenditure by the households in the Lam Pao sample and only expenditure on major consumer purchases and on secondary household enterprises like handicrafts and fishing were recorded. For this reason, any assessment of general expenditure levels of the farm family must rely on secondary information. For rice consumption levels, the calculations from Huay Sithon presented earlier of approximately 310 kilogrammes per capita have been used in the subsequent assessment of expenditure.[12] For general expenditure levels recourse is made to the National Statistical Office study of household expenditure made in 1962-63.[13]

The 1962-63 Household Expenditure Survey calculates average monthly expenses for families in both town and country in each of the regions of Thailand. Figures for villages in the Northeast region by size of family are shown in Table VI-3. These show an average monthly expenditure ranging from some 274 baht per month for families of 2-3 persons to 555 baht for families with eight persons or more. It will be remembered that the average family size in the Lam Pao sample survey is just under seven persons; such a family may be expected to spend 419 baht per month, giving an annual total of just over 5000 baht. This, however, includes a figure of 100 baht per month which is the value of

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12. Ng,R.C.Y., "The Socio-Economic Conditions in Huay Sithon", Report for F.A.O., London 1972, Volume 1, p.17, mimeo.

13. National Statistical Office, "Household Expenditure Survey, Advance Report, B.E.2505. The Northeast Region", Bangkok 1963.

TABLE VI - 3

Average Monthly Expenditure N.E. Villages

By Size of Family

Family Size	2-3	4-5	6-7	8+
Category:		(Baht)		
Food and Drink[1]*	66.23	78.73	76.83	92.70
Clothing and Materials[2]	48.15	57.08	69.36	92.33
Housing and Furnishings[3]	27.50	30.30	32.57	36.36
Household Operations[4]	8.40	8.84	9.88	11.05
Medical and Personal Care[5]	18.25	21.12	26.52	27.20
Transportation[6]	7.37	11.72	13.08	19.64
Recreation and Education[7]	5.85	12.93	16.08	21.08
Tobacco and Alcohol[8]	12.63	16.52	15.92	20.41
Misc. Household Expenses[9]	13.22	28.23	26.93	54.22
Gifts & Contributions[10]	17.29	15.11	20.48	24.24
Taxes	0.45	0.89	1.60	0.81
Total	225.34	281.47	309.25	400.04

Source: N.S.O. Household Expenditure Survey 1962-3, Table 2:1 p. 22

* See annotation

ANNOTATION FOR TABLES VI - 3,4,5

1. All food and drink except Alcohol and the Value of Rice taken from Store (Tables, 3,4).
2. Ready-Made Clothing, Cloth and Materials to Make Clothing, Footwear, Tailoring Services, Purchase of Sewing Machines.
3. Rent and Repair of Dwellings: Insurance, Interest on Mortgages, Furniture, Mats, Cooking Utensils, Electrical and Household Equipment, Blankets, Towels.
4. Electricity and Cooking Fuel, Matches and Candles, Ice and Water Charges, Wages to Servants, Telephone
5. Doctor Fees, Drugs, Cosmetics, Beauty Parlour and Barber.
6. Purchase and Repair of Vehicles. Local Bus and other fares.
7. Includes Gambling Losses, Lottery Tickets.
8. Includes Betel Nut.
9. Includes Insurance Premiums, funeral, wedding and ceremonial expenses. Legal fees. Interest on borrowed money or services.
10. Money to religious institutions. Cash gifts for support and persons outside the family, food for priests.

rice taken from store; this has been calculated separately for the families in the Lam Pao survey and may be excluded, giving a cash expenditure of 309 baht per month or 3710 baht per year. A further reduction of 195 baht for consumer goods purchased recorded in the Lam Pao questionnaire leaves a standard annual expenditure for a family of six or seven of about 3515 baht per annum.

These calculations were used for each farm family size group to give a minimum annual expenditure for all the households in the Lam Pao survey. In addition the value of estimated rice consumption according to 1970-71 prices and the cost of any consumer goods purchased during the year or any work carried out on the family dwelling were also added. Farm expenditure was not included and expenditure on livestock was not available. On this basis it was calculated that the average expenditure for a farm family in the area would be in the order of 4761 baht, thus giving an average savings level of 1173 baht.[14]

Clearly, however, such a calculation can be no more than a general guide. As the Household Expenditure Survey itself shows, expenditure per farm family is highly elastic according to level of income. Table VI-4, from the same source, indicates that for families with income below 3000 baht the average monthly expenditure would average only 197 baht excluding the value of paddy, the proportion of which in

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14. This calculation uses the 310 kilogrammes level of per capita rice consumption. If the later calculation of 330 kilogrammes made at Lam Pao is substituted, then total expenditure rises to 4836 baht and savings fall to 1098 baht.

TABLE VI - 4

Average Monthly Expenditure. N.E. Villages by Income Group

Income Group	-3000 baht	3000-5999	6000-11999	12000-17999	18000+
	(Baht)				
Category:					
Food and Drink[1]*	47.04	130.38	235.31	447.72	451.73
Clothing and Materials[2]	51.25	82.54	153.04	234.23	287.36
Housing and Furnishings[3]	25.47	42.17	57.10	102.17	138.53
Household Operations[4]	6.38	15.70	21.64	30.30	62.24
Medical and Personal Care[5]	16.23	37.31	54.08	102.94	131.32
Transportation[6]	7.77	13.89	32.30	118.50	241.12
Recreation, Education[7],	7.20	23.12	49.35	88.47	170.49
Tobacco & Alcohol[8]	11.66	23.52	35.84	70.72	120.99
Misc. Household Expenses[9]	24.29	42.94	65.55	101.84	76.99
Gifts and Contributns[10]	14.47	28.99	44.83	67.23	34.78
Taxes	0.45	1.62	3.14	4.39	22.88
Total	197.29	442.18	752.16	1368.51	1748.43

Source: N.S.O. Household Expenditure Survey 1962-3 Table 1.1 p.19.

* See annotation accompanying Table VI-3

total expenditure increases as income increases. By contrast, a family with an annual income of between 6000 and 12000 baht might be expected to spend 752 baht per month excluding paddy value. Again the Household Expenditure Survey does tend to value goods produced within the farm family which are estimated to constitute some 39.6% of the total expenditure of the average Northeast farm family and which are particularly important in the categories of foodstuffs and housing, the real essentials of life. (Table VI-5). On the other hand, it should be noted that the Household Expenditure Survey was made in 1962-63. Since then, the commercialisation of the Northeast has reduced the amount of goods produced on the farm, particularly in terms of clothing and household goods. At the same time, allowance should be made for a steady inflationary movement of prices in Thailand since 1962. Although prices in the Northeast fell in relation to the rest of the country in 1970, it may be calculated that prices in the towns of the region in that year had risen about 17-20% over the 1962 level.[15] For consumer goods these prices may be taken to apply equally for Northeast villages.

With these reservations and qualifications, the calculation of estimates of savings in the Lam Pao study area in 1970-71 may be examined, bearing in mind that the calculation of total income does include a valuation of farm household produce to set against the observations of the proportion of non-cash value noted above. Moreover, the removal of rice consumption from the general National Statistical Office estimates has taken care of the difference in rice prices

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15. Calculated from the Bank of Thailand Monthly Bulletins, 1970.

TABLE VI - 5

Average Monthly Expenditure: Cash & Value of Goods and Services Home Produced or Received Free. Northeast Villages

Category		Purchased	Home Produced/ Received Free	Total
		(Baht)	(Baht)	
Food & Beverages[1]*		79.80	144.00	223.80
of which	Rice	31.37	98.90	
	Meat	14.07	0.90	
	Poultry	2.49	10.75	
	Fish	10.50	14.70	
	Vegetables	6.94	8.10	
	Spices	3.92	2.45	
	Fruit	1.96	3.90	
Clothing and Materials[2]		67.47	15.44	82.91
Housing[3,4]		41.25	21.77	63.02
Medical & Personal Care[5]		23.59	0.92	24.51
Transportation[6]		13.30	0.47	13.77
Recreation & Education[7]		14.57	1.14	15.71
Tobacco & Alcohol[8]		16.58	5.64	22.22
Others 9,10		31.24	-	31.24
TOTAL		287.80	189.38	477.18

Source N.S.O. Household Expenditure Survey 1962-3, Table 6, p.33

* See Annotation accompanying Table VI-3

between the years in question. Although only a general estimate, the calculations do seem to suggest that on a single year's operation a large number of farm families in the Lam Pao sample survey are not in a position to accumulate capital in any single year of operation, even allowing for an overestimation of general expenditure in the N.S.O. figures. (Table VI-6)

Confirmation of this situation was to be found from a supplementary study carried out in Ban Na Chuak Nuea in 1975. In this survey an attempt was made to assess the surplus/deficit position of a random sample of farmers in the village over a period of 12 months from June 1974 to May 1975. Farmers were asked to state the months in which they received cash income and their approximate expenditure on the various items bought for the farm and the household, once again broken down, where possible, into the month of purchase. Where no specific month for the expenditure was given, this was evenly divided between the twelve months.

Examination of the data from this survey revealed that as many as 14 families out of the 40 households enumerated in the sample had a deficit balance over the twelve-month period. This was despite the fact that crop prices over the period, particularly that for rice, and the selling prices for cattle and buffaloes were generally favourable. The deficits ranged from a mere 53 baht through to as much as 16500 baht and it was clear that emergency expenditures, particularly on hospital treatment and ceremonies, could leave even the richer families with a short-term deficit. Another 15 families fell into temporary deficit at some stage during the twelve months. Only 27.5% were consistently in surplus in each month. (Table VI-7).

TABLE VI - 6

Estimated Savings Level of Farm Families
Lam Pao Survey 1970-71

Village	Savings Level (Baht)							
	-2500	-2500 to -1000	-1000-Zero	Zero-1000	1000-2500	2500-5000	5000-10000	10000+
	No. Families							
Ban Na Chuak Nuea	3	12	-	2	4	6	6	2
Ban Tum	9	17	5	5	6	8	4	3
Ban Um Mao	5	8	6	3	2	3	6	2
Ban Fai Taek	2	6	4	-	3	5	4	1
Ban Lek	11	12	6	2	5	3	1	2
Ban Non Sung	10	9	3	3	-	4	3	1
Ban Lao Yai	3	5	1	1	-	-	1	-
Total Sample	43	69	25	16	20	29	25	11

Where such deficits occur, it is, of course, entirely possible that households have money accumulated from former years. This possibility is not reflected in the number of households in the main Lam Pao survey admitting to having a savings account at either government or commercial savings banks. In 1970-71 only 12 farmers were recorded as holding bank accounts, in the second year of enumeration only 13. Although this may be a matter for secrecy, it partially reflects some considerable mistrust of such institutions and their inconvenience for many farmers who are infrequent visitors to the town. Many apparently prefer to store surplus capital in their houses or other hiding places, but the incidence of this is hard to ascertain. The hoarding of large sums in such caches appears, however, rather unlikely and the small number of bank accounts recorded may also equally reflect the small amount of capital available for semi-permanent deposit in a bank account.

In fact the pattern of capital accumulation in the Lam Pao study area appears to correspond very much to the traditional subsistence pattern described by various writers. Although rice marketing in Kalasin province has a history of over 30 years now and cash cropping of kenaf is also well-established, there is only a partial commitment to the market economy. The threat of crop loss means that capital, in the form of paddy, must be kept in store against the possibility of harvest failure. Where this is a frequent occurrence, it necessitates the spending of any other stored capital in addition. This must therefore be kept in a readily accessible form, available for easy disposal. The wealthier members of

TABLE VI - 7

Ban Na Chuak Nuea : Monthly Cash Deficits 1974-75

	Month	No. Deficits in Month	Cumulative No. Deficits
1974	June	22	22
	July	24	22
	August	27	23
	September	24	23
	October	26	23
	November	24	24
	December	21	20
1975	January	24	17
	February	22	17
	March	21	19
	April	14	13
	May	21	15

Source : Lam Pao Dry Season Supplementary Survey 1975.

the community seek to purchase land as the safest area of investment. Those with smaller amounts of capital are forced to choose other directions. Until fairly recently, investment in jewelry was a common choice. In a largely subsistence economy there is a

> "..lack of positive economic incentive of profit to be obtained through investment of savings in agriculture. Since the price of gold is very steady, villagers frequently wear jewelry for some time and then sell it at little or no loss when they need money. Jewelry may thus function as a form of non-interest bearing investment." 16

Over the last decade or so, the importance of jewelry as an investment has declined among the smaller farmers. Although the risk of crop loss has been too high to warrant any large-scale commitment to agriculture, the demand for and the quality of livestock has attracted many people. Livestock are clearly a useful, easily disposable and possibly interest-bearing asset.

> "With the small farmer cattle often serve two purposes. They are a means of production but at the same time they play the role of 'savings box' or rather of secret reserve. In emergency cases where cash is required at short notice cattle are sold." 17

In Ban Lao Yai in the Lam Pao study area, where crop loss is expected in up to three years out of four, the villagers were convinced of the usefulness of livestock. They could be used for ploughing and for hauling carts; they gave fertiliser for the fields; they could eventually be used as meat. If

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16. Ingersoll,J., "Social Feasibility of Pa Mong Irrigation. Requirements and Realities", Bangkok 1969, pp.79-80.

17. Food and Agriculture Organisation, "Agricultural Credit through Co-operatives and Other Institutions", Rome 1965, footnote 4, p.50.

one were lucky, moreover, one could take a cow to the bull and at little expense increase one's assets by over 1000 baht. In a bad year, of course, the livestock could be sold off for cash to buy rice and other requirements.

With the growth of commercialisation in the economy of the Northeast, this old pattern of capital investment has undergone more fundamental changes. More farmers have been able to acquire a regular cash income from the development of upland for the cultivation of first kenaf or maize and, more recently, cassava. At the same time greater opportunities have been available for earning money working away from the farm on road construction, irrigation project work or on other government investments in the region. These trends have provided many farmers with a greater cash component in their income structure than ever before and might be supposed to have increased the possibility of capital investment in agriculture. While this might be the case with some farmers - and we have noticed above[18] a case of a farmer using the earnings from his work as a guard at the Lam Pao dam site to acquire land within the irrigible area - not all have been able to acquire land for upland crops or to obtain off-farm employment on a regular basis. The latter is often of a very temporary nature and it would be dangerous for a farm family to rely upon it.

Equally important, however, is the fact that the new developments have been accompanied by or even stimulated by a growing awareness and an increase in felt needs on the part of the Northeastern farmer. Better communications have

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18. See above, Chapter IV.

brought more goods to the shops of the small provincial town and have allowed the farmer to develop wider contacts, showing him the material wealth of his fellow-countrymen in the towns and in other regions. Some goods like radios and bicycles, once luxuries, have become necessities of life. These observations are confirmed from the evidence of the Lam Pao study villages. By 1970-71 some 56.7% of farmers had visited the regional capital at Khonkaen and as many as 30.7% had even been to Bangkok. The numbers seemed to be growing yearly, moreover, with figures of 60.5% and 28.9% respectively being recorded in the following year. Questions also revealed an increasing incidence of purchases of consumer goods in the last few years as well as an increase in attention to new house construction and repair. Figure VI-1 illustrates this tendency for a number of major consumer items common in the area.

Motooka, observing the same phenomenon mainly in the context of the Central Plain of Thailand, has suggested that some Thai farmers were

> "..living in a certain state of frustration,"[19]

to the extent that they would sometimes borrow money in order to purchase such consumer goods and would run the risk of falling into debt as a result. He has indeed visualised that

> "..a selection process may begin to operate in which the shrewd and provident farmers become more prosperous while the

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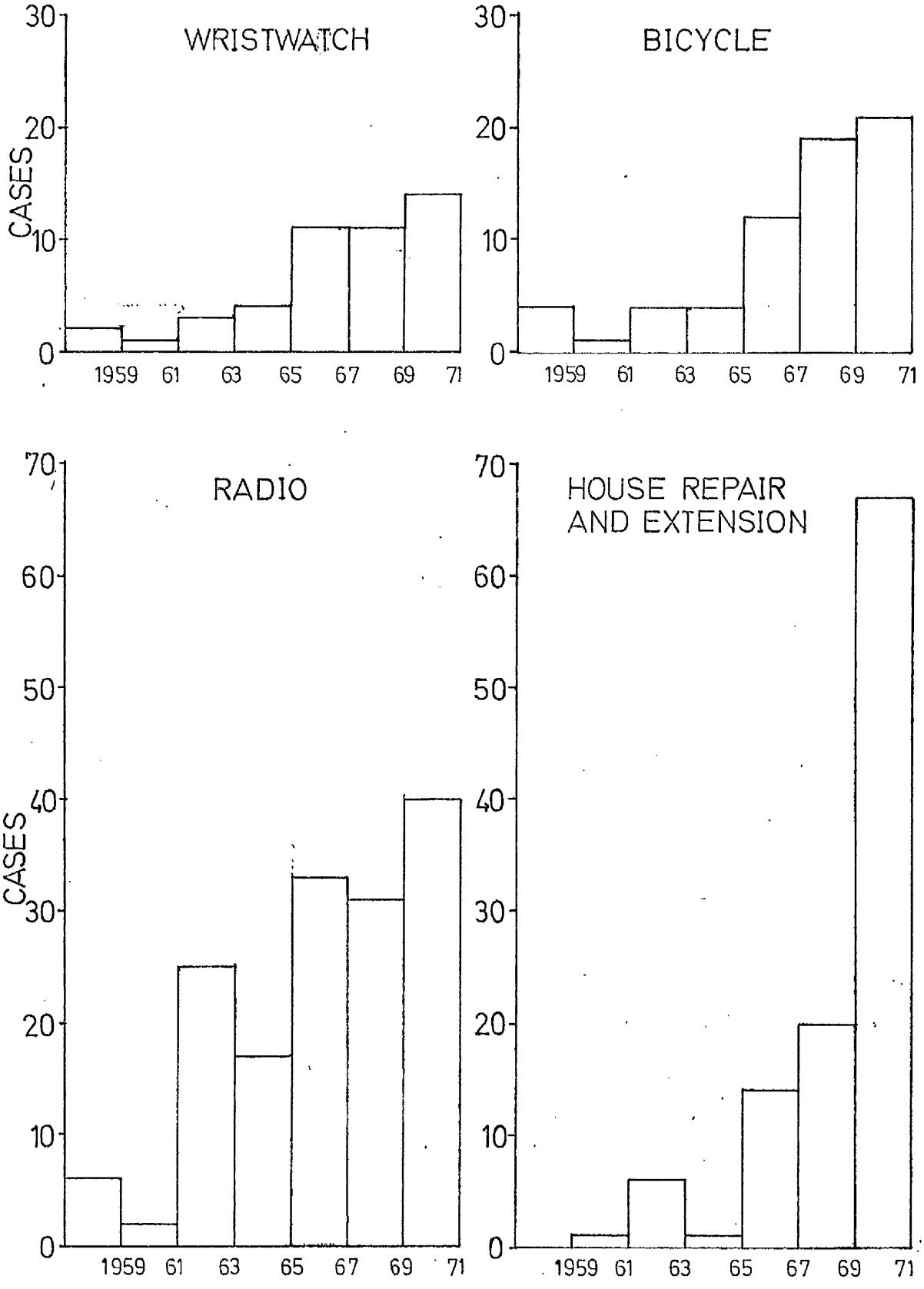
19. Motooka, Takeshi, "The Conditions Governing Agricultural Development in Southeast Asia", The Developing Economies, volume 5(3), 1967, p.427.

FIGURE VI-1

DATE OF EXPENDITURE ON CONSUMER ITEMS
LAM PAO SURVEY 1971-72



> improvident ones lose their land and either become tenants or migrate to an urban area." 20

It is not suggested that this process is currently at work in the Northeast region where greater difficulty in obtaining the consumer goods may reduce the temptation in a situation of low overall prosperity. On the other hand, it is probable that the profits acquired in good years for agricultural production are being more often converted into the non-disposable assets like bicycles and radios than into the safer traditional investments like gold or livestock, so that in a bad year a farmer is unable to draw on his previously accumulated disposable assets. It seems probable too that a good deal of the capital derived from the development of kenaf cultivation and from off-farm employment opportunities is also being dissipated in increased consumer spending, rather than being used in agricultural investment.

Although a minority of farmers in the area of the Lam Pao irrigation project will be able to finance agricultural investment on a larger scale than at present from their own capital, for others the problems of competing with the environment and the desires for increased consumer spending will have brought no great change in their capital position despite the opportunities offered for cash income from upland cultivation and off-farm employment. Such farm households may need to turn to the third possible source of capital to finance any future investments and borrow money from other sources in order to generate an improvement in their own productive capacity.

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20. Ibid., p.431.

The Traditional Sources of Credit

In the traditional, self-sufficient economy of the Northeast of Thailand, it was possible to borrow capital sufficient for most purposes at the village level. Zimmerman, writing in 1930-31 before the first rice mills had been established in the central part of the region, noted that such credit was, however, of minor significance.[21] It was used mainly to assist farmers who had suffered a famine or other serious crop failure, or alternatively for merit-making at funerals or on entering the priesthood. Such credit was usually provided by relatives and was returned at the convenience of the borrower. In a commercial economy, however, the need for credit is much increased, usually in order to support production activities. A time is set for repayment, security is usually required and interest is commonly charged.[22]

In Northeast Thailand, despite the increasing commercialisation of the regional economy, the structure of the credit supply market at the non-institutional level still bears many of the characteristics of the subsistence situation outlined by Zimmerman. In the Lam Pao irrigation project area, for example, non-institutional loans remain small in size, are supplied mainly by friends and relatives and are used essentially for consumption purposes. Only a minority of larger loans are given for productive investment and involve a heavy interest charge.

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21. Zimmerman,C.C., "Thailand Rural Economic Survey 1930-31", Bangkok 1931, p.195.

22. Ibid., p.196.

In the Lam Pao survey questionnaire, farmers who borrowed money were asked to give the purpose or intended purpose for which the loan was made. In the first year's survey, the farmers' replies were recorded in a rather exploratory and often crude manner. In the following year a greater breakdown was achieved and for this reason emphasis is placed here on the 1971-72 data. The 1970-71 pattern is recorded for comparative purposes in Table VI-8.

This table demonstrates that most of the families who borrowed money from non-institutional sources sought the loan for use in what may be classified as 'household expenditure'. This group is broadly composed of two types of loan, those used for medical expenses and those put to other forms of consumption expenditure. This latter category included use for the purchase of food where the family had suffered crop loss, for clothing and household utensils and for such recurrent payments as school fees. In general both these consumption loans and those made for medical expenditure are very small, averaging only 507 baht in 1970-71 and still less (399 baht) in 1971-72. Only in a few isolated cases, usually where medical expenditure involved more than just the occasional purchase of medicine, were larger loans made for this purpose.

By contrast the loans made for what might be termed production purposes are in general larger. Leaving out the two groups of unspecified loans and those made for house construction and development, the average loan made for these purposes was over 1000 baht in each of the two years of survey, 1459 baht in 1970-71 and 1131 baht in 1971-72. As Table VI-9 shows, only a very few were of amounts of less

TABLE VI - 8

Use of Loans Lam Pao Survey
1970-1 and 1971-2

Purpose	1970-1 No.	%	Amount (Baht)	%	1971-2 No.	%	Amount (Baht)	%
Household Consumption of which	44	67.7	22,350	45.0	42	57.5	16.760	31.0
Consumption	-			-		20(27.4)	9100	16.8
Medical Exp.	-			-		22(30.1)	7660	14.2
House Construct^{n}	4	6.2	2,500	5.0	6	8.2	7700	14.2
Purchase of Livestock	5	7.7	7,300	14.7	7	9.6	12,750	23.6
Land Purchase & Development	3	4.6	17,000	34.2	10	13.7	14,100	26.1
Working Capital	9	13.0	500	1.0	1	1.4	500	0.9
Others	-	-	-	-	7	9.6	2300	4.3
Total Sample	65	100.0	49,650	100.0	73	100.0	54110	100.0

than 250 baht and most of these were cases in which farmers were making up larger sums when they had themselves most of the capital required. One farmer in 1970-71, for example, was just 100 baht short of the price of buying a buffalo which he made up temporarily by a short-term loan.

Although this category of 'production' loans are larger than the typical 'consumption' loan,[23] they are essentially as traditional in character as the latter. It was noted above that the typical investments for farmers in high-risk, rain-fed, subsistence conditions in Northeast Thailand have been land and livestock and the use of non-institutional credit further emphasises this pattern. Although the consumption loans are numerically much more important than production loans, the purchase of land and the purchase of draught animals are the most important single uses of loans in terms of the total amount of investment. Land purchase constitutes 26.1% of the total amount in 1971-72 and the purchase of livestock is only marginally behind with 23.6%. Most of the latter group are loans for draught animals, but the category contains also the largest single loan recorded in which a Ban Fai Taek farmer had borrowed 7000 baht to finance an enterprise in cattle trading.

This situation is similar to that recorded by Chamlong

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23. In making a distinction between 'consumption' and 'production' loans, one should, of course, note with Rozental, Alex A., "Finance and Development in Thailand", New York, 1970, p.48, that "Even when borrowing is used for purposes of consumption, it often directly finances the productive process by providing rural households with the wherewithal during the period of production of agricultural output."

TABLE VI - 9

Size of Loan by Purpose:
Lam Pao Survey 1971-72

Purpose	Size of Loan (Baht) 0-100	100-250	250-500	500-1000	1000-2500	2500+	Average Loan (Baht)
	No. Cases						
Land Purchase	-	1	4	-	2	2	1455.6
Purchase Draught Animals	1	1	3	1	-	1	821.4
Purchase Fertilizer	-	-	1	-	-	-	500.0
House Construct^{n}	-	1	3	1	-	1	1283.3
Land Improvement	-	-	-	1	-	-	1000.0
Medical Expenses	5	4	11	-	2	-	348.2
Household Consumtn	5	1	12	1	1	-	455.0
Others	1	1	2	2	-	1	1328.6
Total Sample	12	9	36	6	5	5	741.2

in a survey for the Mekong Committee in the Northeast region, at the nearby Nongwai irrigation project in Khonkaen province. Here the three main categories were land clearing (41,000฿ or 27.6%), purchase of cattle and buffalo (34,400฿ or 22.9%) and household expenses (18,000฿ or 12.0%).[24] The figures are not strictly comparable because the Nongwai details are inclusive of government institutional loans, but one may also note nevertheless that

> "..the amount spent on fertiliser and insecticides is negligible." 25

This latter statement is undoubtedly also true of Lam Pao where the use of non-institutional loans for short-term finance of production is strictly limited. In 1970-71, only 400 baht could be said with certainty to have been used in this way, 300 baht to hire labour and 100 baht for a fish-trap; in 1971-72, 500 baht was put to the purchase of fertiliser and 1000 baht on the rather vague category of land development, together accounting for no more than 2.8% of the total amount borrowed.

A second traditional characteristic related to the use of loans chiefly for consumption purposes and to their generally small size has been noted by Millard Long. Discussing the situation in Thailand in general, he has suggested that many loans made by farmers are in fact only made for short periods. This he has related closely to the highly seasonal pattern of

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24. Chamlong Tohtong, "Report on Benchmark Socio-Economic Survey of Nongwai Irrigated Area (Right Main Canal) as of 1968", Bangkok 1969, Table 16.

25. Ibid., p.23.

agricultural activity in the semi-subsistence context.[26] Rozental too has it that

> "The rhythm of the monsoon still permeates the cycle of credit throughout the economy." [27]

In most cases of loan, a farmer is forced into temporary debt by a sudden emergency for which his cash funds are insufficient, usually at the time of the year furthest away from the harvest. Janlekha has noted that in the area of the Saraphi project in changwat Nakorn Ratchasima scarcity of cash often occurs between the months of June and October[28] and this is an area of upland cropping where some source of income might be expected prior to the rice harvest.

The evidence from the investigations in the Lam Pao area strongly supports these observations. Most farmers borrowed money with the intention of paying back after the coming harvest and most were short of cash in the period prior to the kenaf harvest from June to September. Figure VI-2 shows the monthly breakdown of income for the farm households in the Lam Pao sample survey for 1971-72 for the three main income sources, crops, livestock and off-farm sources. This shows a highly seasonal pattern, reaching a maximum in February and March just after the rice harvest and a minimum in July. It may be added that the minimum occurs in those months when farm investment in such items as

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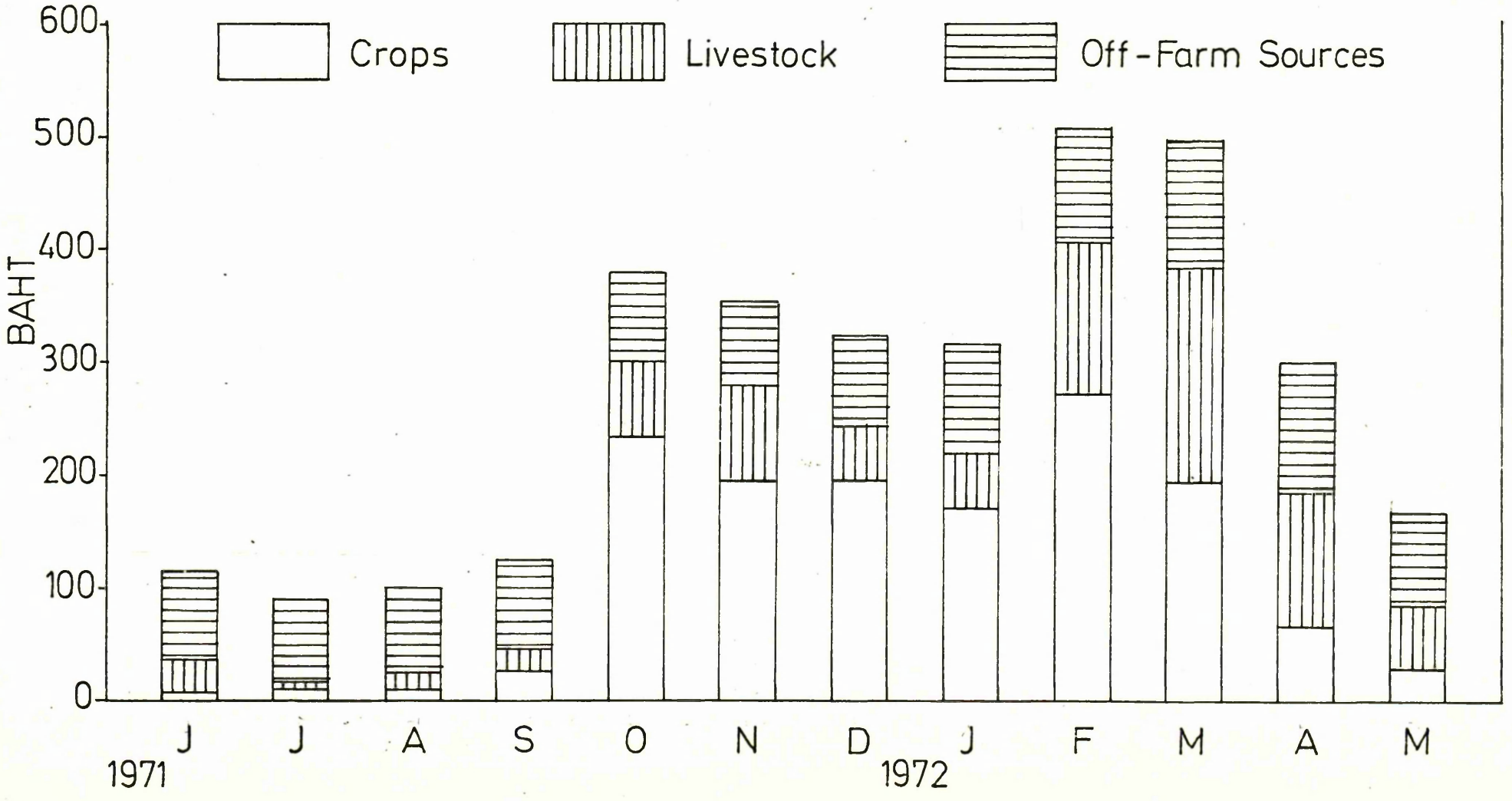
26. Long, Millard F., "Aspects of Agricultural Credit in Thailand", Bangkok 1963, p.132.

27. Rozental, Alek.A., op.cit., p.47.

28. Kamol Janlekha, "Saraphi : A Survey of Socio-Economic Conditions in a Rural Community in North-East Thailand", World Land Use Survey, Occasional Paper, No.8, London 1968, p.45.

FIGURE VI-2

MEAN HOUSEHOLD INCOME FROM MAJOR SOURCES BY MONTH LAM PAO VILLAGES 1971-1972



fertiliser, insecticide and hire of labour for transplanting is at its highest. By contrast it may also be noted that at the time of the year at which the survey was conducted, during April and May, only 28.8% of the families who had borrowed money during the previous twelve months were reported as currently in debt. As has been suggested in another context this

> "...was normally the period when indebtedness was lightest because those who could afford to pay off their debt would have already done so a few months after harvest, i.e. between January and March." 29

The suggestion that non-institutional loans were mainly for short periods was examined in the Lam Pao sample survey. This aspect was neglected in the first year of enumeration, but the 1971-72 survey revealed that, of the loans for which a period had been specified, and most had been already repaid at the time of the survey, some 73.5% were outstanding for three months or less and only 10% extended to one year or more.

Long has demonstrated the typical situation in a graphical model in contending that

> "Whether a farmer will need seasonal credit depends on the level of his assets." 30

Figure VI-3 depicts the situation of three farmers with differing capital assets. Farmer A has sufficient throughout the year, so that he never needs to borrow; Farmer B has a temporary period when he must borrow to receive goods on credit; Farmer C must immediately use his harvest receipts

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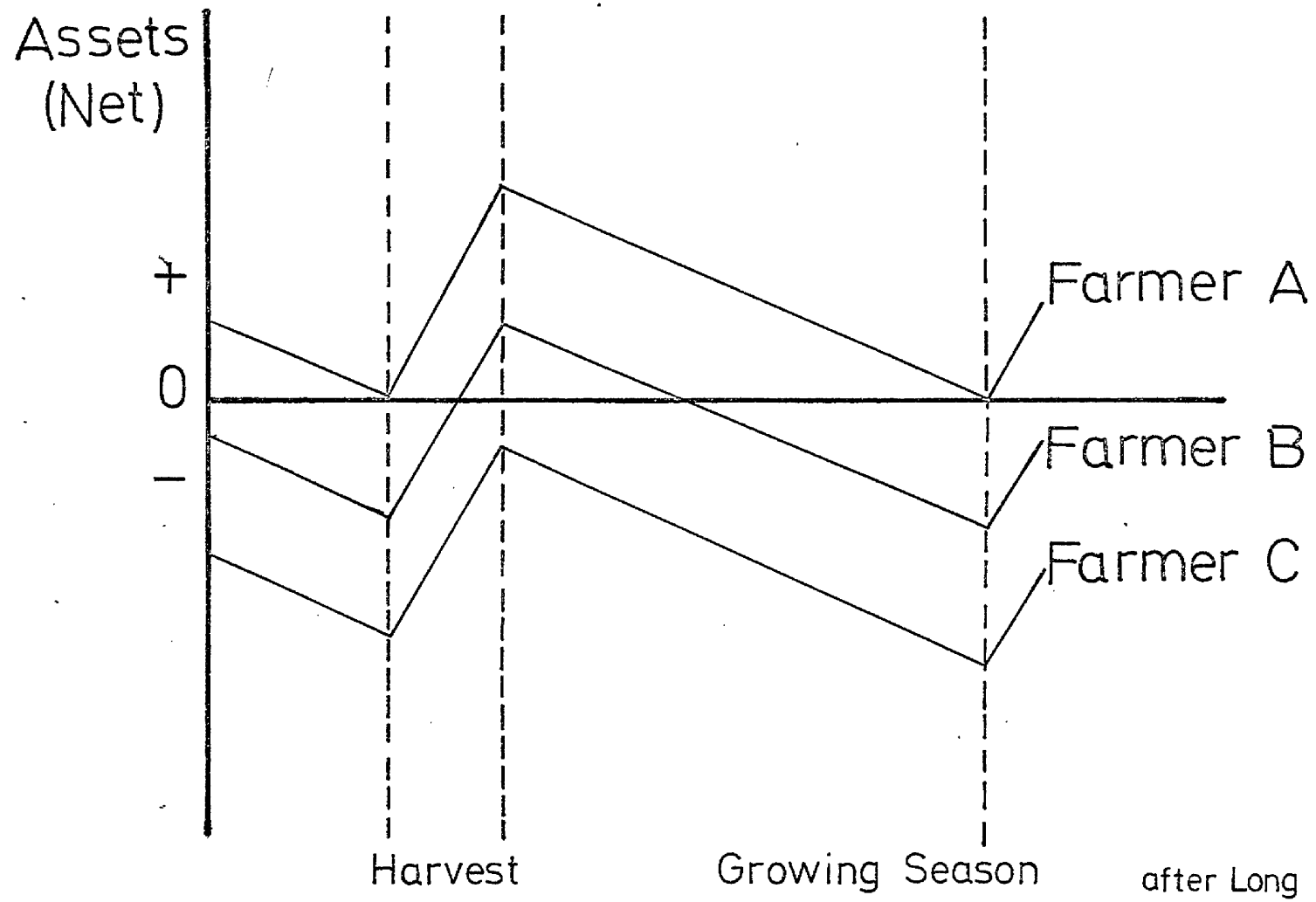
29. Mekong Committee, "Report on a Socio-Economic Survey of Farmers in Huay Sithon (Kalasin) 1969-70", Bangkok 1970, p.25.

30. Long, op.cit., p.137.

FIGURE VI-3

SEASONAL CASH BALANCE IN TRADITIONAL MONSOONAL AGRICULTURE



after Long

to pay off accumulated debt and is never actually out of debt. The position of this latter farmer is extremely serious.

The situation as depicted in Long's model may be seen in reality in examination of the data from the supplementary survey made in Ban Na Chuak Nuea in 1975. The overall seasonal pattern may be seen from the number of farmers in deficit in each of the months. If one assumes a zero savings level at the end of May 1974, then by the end of June 22 families, (55% of the sample) were in deficit. The numbers in deficit then rise until October when 26 families were in this position, although the maximum number of deficits occurred in August with 27 then losing money on the year's balance. After October, as money comes in from kenaf sales, the number of deficit families falls to 17, rises slightly again in March, but falls to its lowest level in April with the sale of rice following the harvest and the availability of casual off-farm labouring opportunities.[31] At this stage only 32.5% of households were in deficit.

Within this overall pattern, certain individual households correspond closely to Long's model farmers. Typical of Farmer A might be household no. 21. (Figure VI-4). Starting from a small surplus position in June 1974 of 1842 baht, this family spends money steadily through the growing season to reach a low of 892 baht in December. Hereafter sale of kenaf causes a substantial rise in the level of cash assets to 2634 baht, before a further depreciation of the assets up to the end of the year. Household no. 103 demonstrates an even better position with capital accumulation continuing almost throughout the year.
In the planting season, the asset level varies

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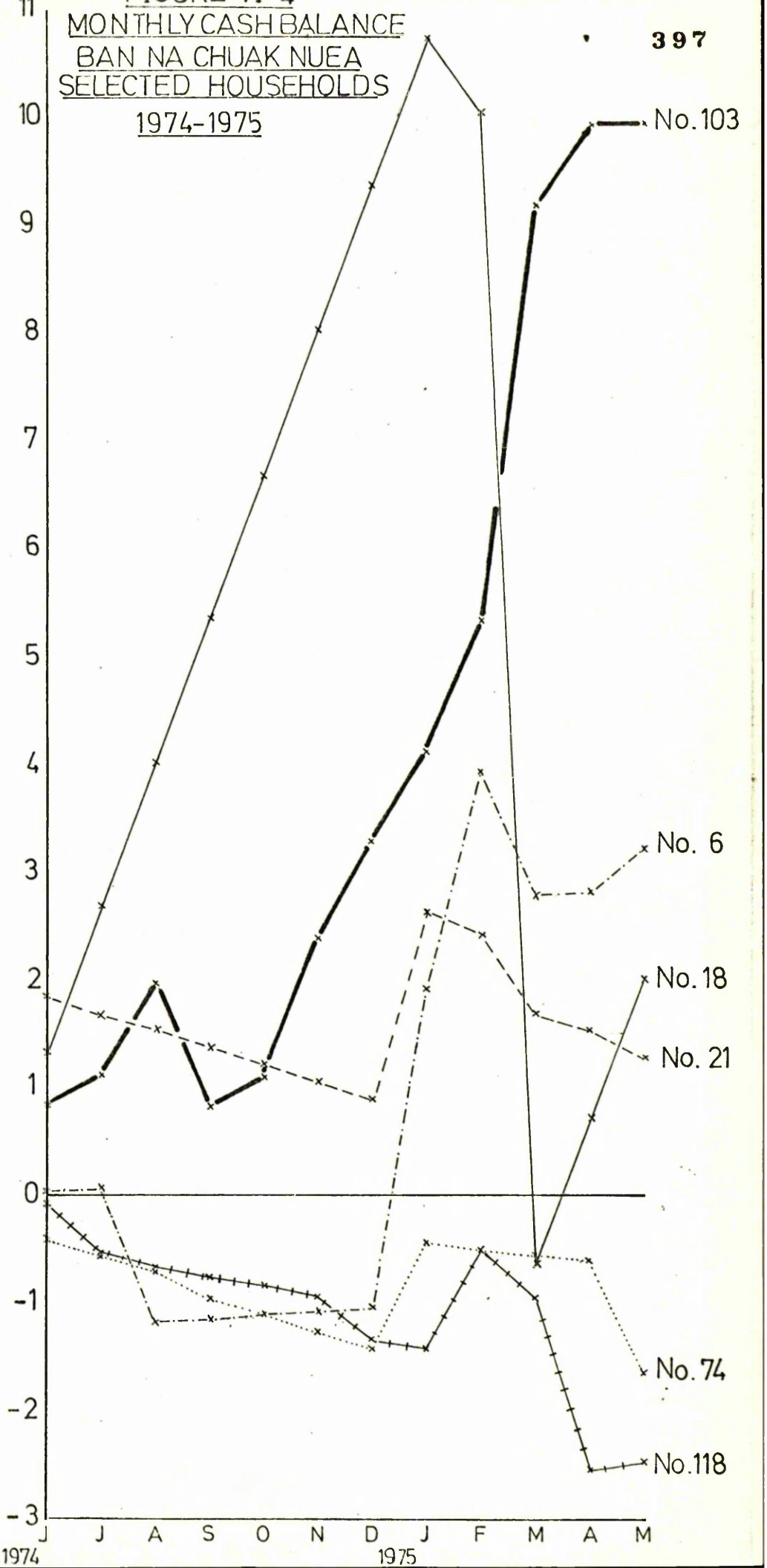
31. Notwithstanding the availability of irrigation water, the 1974-75 harvest season was rather late, mainly taking place in January-February.

FIGURE VI-4

MONTHLY CASH BALANCE
BAN NA CHUAK NUEA
SELECTED HOUSEHOLDS
1974-1975



between 800 and 2000 baht as varying expenditures eat into the regular salary of one member of the household. A significant rise in assets comes with kenaf sales in November and December, followed by an even more dramatic increase through rice sales in March. A capital saving on the year of 9940 baht is made.

The converse pattern of a constant deficit situation, Long's model Farmer C, may be characterised by Ban Na Chuak Nuea farmers nos. 74 and 118. In each case these households are essentially dependent for their cash income upon the proceeds of the sale of crops at the beginning of the calendar year. General consumption expenditure throughout the rest of the year leads them into steadily deepening debt, relieved only by some very minor casual labouring at various times. Neither farmer is ever out of a deficit position on the year's account. For other households like no. 95 much the same pattern applies. Here, however, income from crop sale in March and April just takes this family into the black for two months until the cash accumulation is again eaten away by consumption expenditure.

'Farmer B' might, however, be more properly portrayed by household no. 6. This household begins the year in a position of marginal cash surplus, but rapidly moves into deficit in August through payment for the hire of a buffalo. This deficit position is maintained through to January when sale of rice in that and the following month restores the family's capital position. Household no. 18 shows a different pattern. This family has a regular cash income from salaried and casual wage employment. By February a substantial surplus is accumulated, but the payment for a major extension to the family home in March is even beyond this family's means

and for the one month they fall into deficit. This example illustrates that even the more wealthy farmers may have need of outside capital from time to time, whether from emergencies, such as a major illness or through indulgence in major consumption expenditure. Farmer no. 18 may, of course, have had further stored capital from previous years to allow the planned expenditure on house development. Where the outflow of capital is caused by an emergency, however, this is rarely the case. Two households in the survey were in precisely this situation, with particularly large deficits brought about by the need for costly medical treatment for the household head. Both families had extensive land holdings in the village and were normally able to accumulate capital. In 1974-75 both had cash deficits of over 15,000 baht and were having to borrow.

Such situations make it clear that recourse to borrowing is not restricted to those families who appear to be in poor economic straits throughout the year. Temporary debt is a very common phenomenon even for households whose normal level of cash assets is quite high. Temporary expenditure on such contingencies as illness or funeral and wedding ceremonies can affect those in a healthy capital position. Rich and poor alike can be forced to borrow.

This assertion is supported by an analysis of those families who borrowed money in the 1970-71 crop season, regardless of the use to which they put it, in comparison with non-borrowers. Characteristics of farmers' level of assets and expenditure were compared by means of a Student's T-test to see if the borrowers differed in any way from those not borrowing. Table VI-10 shows the results of this difference

TABLE VI - 10

Differences Between Borrowers & Non-Borrowers

Lam Pao Survey 1970-1

Variable	't'-value	Significance Level
Cost of Sewing Machine	4.360	99.9
Cost of Bicycle	3.930	99.9
Cost of Home Extension	2.598	99.0
Frequency of Visits to Kalasin	2.286	98.0
Value of Rice Production	1.450	80.0
Total Income	1.433	80.0
Rice Planted Area	1.421	80.0
% Rice Sold	1.358	80.0
Income from Off-Farm Source	1.317	80.0
Income from Rice	1.300	80.0
Cash Inputs on Kenaf	1.297	80.0

N.B. Borrowers are Case 1. ∴ Positive 't' value indicates higher average for each variable

of means test. Only in terms of expenditure on major consumer goods could the null hypothesis of no difference between borrowers and non-borrowers be rejected at the 95% confidence level. Only in respect of having less capital immediately available for major consumer expenditure could borrowers be said to be poorer than those that did not borrow. For other items, rejection of the null hypothesis was difficult. Differences in crop values, total income levels, commercialisation and size of land assets were significant variables of differentiation only at the 80% confidence level. Overall it was impossible to conclude with any degree of certainty that borrowers represented those in a state of severe capital shortage.

Nor does it appear that the amount borrowed by a farmer, at least where non-institutional loans are concerned, is closely related to his size of holding or his overall income level. Rozental, discussing the work of Pantum et al. suggests that

> "..For those who actually incurred debts, the size of the debt increases with income as well as with area cultivated per farm.... It appears that the more prosperous the farmer, the more he is willing to borrow and the greater the amount of debt he will contract."32

This contention is made, however, in the overall context of Thailand as a whole and it includes loans made by government institutions. In the less commercialised environment of the Northeast region, it is not to be expected that the correlation should be so exact. A X^2-Test carried out on data from the Lam Pao survey classifying size of loan by size of holding and size of total income suggested that for non-

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32. Rozental, op.cit., pp.56-57.

institutional loans the relationship suggested by Rozental did not exist. When loans from co-operative organisations and banks were included in the test, the X^2 value, even then, suggested a difference between income groups significant at only the 70% confidence level. Between size of holding groups, the X^2 value was significant at the 95% level, indicating perhaps that farmers taking advantage of the government credit services tended to be those with the larger holdings. This hypothesis is examined at greater length below.[33]

The above discussion has sought to analyse the reasons for the desire to obtain credit from non-institutional sources in the context of the Lam Pao irrigation area. It has been demonstrated that the use of credit does not necessarily imply chronic debt problems affecting a farm family. Non-institutional credit continues to provide for the traditional emergency consumption expenditures, large and small, which may be forced upon even the wealthiest households from time to time. It can usually be obtained from friends and relatives in the recipient's own village. Few farmers have recourse to non-institutional credit for productive purposes. When this is the case, the characteristics of the loan may change. Recourse may be had to commercial, interest-charging sources. Such differences can be seen to some degree in examining the sources of non-institutional loans used by farmers in Lam Pao.

Much has been written of the domination of the small farmer by merchant and middleman in Thailand through the

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33. See below, Chapter VIII.

TABLE VI - 11

Sources of Credit by Region (percentage)

Source	Central Plain % Loans	Central Plain % Value	North % Loans	North % Value	Northeast % Loans	Northeast % Value	South % Loans	South % Value	Total % Loans	Total % Value
Relative	17.8	22.5	44.8	47.0	50.0	58.5	40.2	43.3	39.9	32.5
Neighbour	14.0	16.7	24.1	19.9	12.1	4.3	15.1	12.9	15.7	15.5
Commercial										
Local Store	39.2	13.9	4.1	3.0	12.1	4.6	12.1	10.9	16.5	
Crop Buyer	8.2	7.9	5.2	10.1	9.1	6.5	13.7	13.8	8.6	
Landlord	6.6	10.7	-	-	1.5	5.2	-	-	2.1	
Moneylender	8.0	14.3	7.8	8.9	3.3	7.5	3.0	1.5	5.4	
Other	3.9	11.0	3.5	1.3	4.5	2.6	3.0	4.4	3.9	
Total Commercial	65.9	57.8	20.1	23.3	30.5	26.4	31.8	30.6	36.5	46.5
Institutional										
Co-operative	1.4	2.0	10.3	9.8	7.6	10.8	12.1	12.9	7.5	
Other Government	0.9	1.0	-	-	-	-	0.8	0.8	0.4	
Commercial Bank	-	-	-	-	-	-	-	-	-	
Total Institutional	2.3	3.0	10.3	9.8	7.6	10.8	12.9	13.7	7.9	5.5

Source: Pantum Thisyamondol, Virach Aeromdee & Millard F. Long
"Agricultural Credit in Thailand, Theory, Data, Policy" Bangkok 1965 p.37.

provision of farm credit, but, whereas in the Central Plain, where commercial agriculture has been developed longer and more intensively than in other regions of the country, commercial lenders[34] furnish 66% of all loans to farmers, a recent survey has recorded a figure of only 31% in the Northeast.[35] (Table VI-11). In the Lam Pao survey area moreover, the role played by merchants would appear to be even smaller. According to the sample surveys made in 1970-71 and 1971-72, the sources of loans made to farmers were distributed in the manner presented by Table VI-12. As can be seen, the great majority of loans were made by relatives in both years, with neighbours and government institutions other important sources. Loans from merchants were generally quite unimportant with only 7.3% of the total number of cases in 1970-71 and even fewer in 1971-72.

It may be that the relative lack of importance of commercial non-institutional lenders is somewhat overemphasised by these figures. As will be seen more clearly in Chapter VII, the distinction between a merchant and a neighbour is often not clearly expressed by the farmer. More prosperous villagers with a little spare capital often indulge in small-scale trading within their own and neighbouring villages and some

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34. Commercial lenders include merchants, middlemen, landlords and shop-keepers.

35. Pantum Thisyamondol, M.F.Long and Virach Arromdee, "Agricultural Credit in Thailand, Theory, Data, Policy", Bangkok 1965, p.37. It may be noted also that Fuhs,F.W. and Vingerhoets,J., in their "Rural Manpower, Rural Institutions and Rural Employment in Thailand", Bangkok 1971, Table 23, p.54 record a similar figure of 29.6% of household borrowing from non-institutional commercial sources in the Phu Wiang district of changwat Khonkaen. This area is more isolated than the Nam Phong district of Khonkaen where commercial non-institutional lenders have been partly replaced by institutional loans and only make up 19% of the total.

TABLE VI - 12

Distribution of Credit by Source

Lam Pao Survey 1970-1 & 1971-2

Source	1970-1 No.	%	Value (Baht)	%	1971-2 No.	%	Value (Baht)	%
Relative	43	52.4	31,800	31.9	49	50.5	41680	27.2
Neighbour	12	14.6	7,350	7.4	15	15.5	9400	6.1
Merchant	6	7.3	5,000	5.0	1	1.0	3000	2.0
Other Non-Institutional	2	2.4	500	0.5	1	1.0	30	0.1
Institutional	19	23.2	55,100	55.2	31	32.0	98,980	64.6
Total Sample	82	100.0	99,750	100.0	97	100.0	153,090	100.0

of these are able to lend capital to their fellow villagers. As will be demonstrated below, loans by neighbours do tend to have similar characteristics to merchant loans, but nevertheless these two in combination remain a minority compared with those from relatives.

The dominance of relatives as the main source of loans confirms that the situation in the Lam Pao area is still very traditional and that commercialisation has not progressed very far. This is perhaps true even in comparison with the nearby Nongwai irrigation project in Changwat Khonkaen. Here figures are only available in terms of the total amounts of loans made from each of the various sources of supply and these are presented in Table VI-13. In comparison with the figures from Lam Pao (Table VI-12) two things stand out. Firstly the importance of institutional loans in both areas is notable. Although at Lam Pao they only constitute between one quarter (23.2% in 1970-71) and one-third (32% in 1971-72) of the total number of loans made, in project areas they account for over half of the total amount of money loaned and in Lam Pao this proportion appears to be growing. Secondly and more significantly in the present context, there is a strong contrast between the importance of loans from relatives in the Lam Pao area and their relative insignificance at Nongwai, where loans from neighbours, including village merchants, merchants and other commercial sources constitute some 77% of the total amount borrowed from non-institutional sources.

Although it has been demonstrated that there is a clear difference in size of loans for consumption and production purposes, it should not be assumed that there is any exact correlation between purpose and source of loan. Some small-scale

TABLE VI - 13

Credit by Source-

Nongwai Irrigation Project
(Right Bank) 1968

Source	Amount -(Baht)	% Total
Relatives	10,420	7.0
Neighbours	21,800	14.6
Merchants	3,800	2.5
Cooperatives & Banks	101,400	67.8
Others	12,200	8.2
	149,620	100.1

Source: Chamlong Tohtong: "Report on Benchmark Socio-Economic Survey of Nongwai Irrigated Area, Right Main Canal as of 1968", Bangkok 1969, Table 18

borrowers are forced to turn to commercial lenders, whereas for some farmers relatives are able to finance substantial borrowing. In fact few loans amounted to more than 1000 baht at all. Of the 63 farm families borrowing money from these sources in the sample survey for 1970-71, only 8 (13%) borrowed amounts in excess of 1000 baht. (Table VI-14). The following year confirmed the pattern with 9 families out of 66 (13.6%) borrowing to this extent. (Table VI-15). By contrast, 67% of borrowers in each of the two years in question were loaned sums of under 500 baht. As the Tables show, there is no marked difference between the size of loans from the various sources. Although in 1970-71, the only two loans over 2500 baht were made by relatives, in the following year, neighbour, merchant and relative loans of this size were to be found.

On the other hand it does seem clear that there is a sharp contrast between the interest rates charged by relatives and those charged by the merchant-neighbour group. It might be supposed that, on an overall basis, the small average size of the non-institutional loans and the fact about 2/3 of these loans were made by relatives of the borrower would mean a low average rate of interest is calculated, working out at 3.7% per month or the equivalent of 44.4% per annum for the 1970-71 survey.[36] It will be noted, however, from Table VI-16 that just under half the loans were charged no interest at all and that the average amount was inflated by interest

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36. Cf. Pantum et al., op.cit.,p.30, who recorded an average rate for the Northeast of 2.7% per month in 1965.

TABLE VI - 14

Distribution of Loans by Source & Size

Lam Pao Survey 1970-1

Source	Size of Loan (Baht) 0-100	100-250	250-500	500-1000	1000-2500	2500+	Total Cases
	No. of Cases						
Relative	6	6	14	13	2	2	43
Neighbour	4	2	3	1	2	-	12
Merchant	2	-	2	-	2	-	6
Other (Non-Institutional)	-	1	1	-	-	-	2
Institutional	-	-	-	1	7	11	19
Total Sample	12	9	20	15	13	13	82

TABLE VI - 15

Distribution of Loans by Source & Size

Lam Pao Survey 1971-2

Source	Size of Loan (Baht) 0-100	100-250	250-500	500-1000	1000-2500	2500+	Total Cases
	No. of Cases						
Relative	9	12	12	10	2	4	49
Neighbour	2	6	3	2	1	1	15
Merchant	-	-	-	-	-	1	1
Other Non-Institutional	1	-	-	-	-	-	1
Institutional	-	-	-	4	8	19	31
Total Sample	12	18	15	16	11	25	97

rates of 20% per month charged by two lenders. In 1971-72 a much higher number of cases of zero interest rates was recorded and the average rate fell to 1.8% per month or 21.6% per year. It is clear from Table VI-16 that the majority of interest-free loans were given by relatives and when the average rate of interest for each group of lenders is calculated, their charges are much lower than those made by neighbours or merchants. These are of approximately the same order. Merchants average a 5% per month interest charge in both the survey years, while neighbours average 4.4% in 1970-71 and 7.9% in 1971-72.

It would appear that such interest rates are rather higher than have been found in the rather better appointed areas of the Northeast. A recent survey in the area of the F.A.O. farm at Huay Sithon concluded that

> "..it did not appear that excessive interest has been charged to the farmer debtors in the area." 37

At Huay Sithon, 48.2% of loans were interest-free, a slightly lower figure than discovered at Lam Pao, but of the rest, only 4.7% were charged at rates in excess of 1% per month. This figure includes, however, a number of cases of institutional loans and of the non-institutional loans, 30.7% are subject to interest of over 1%, very much in line with the 1971-72 record in Lam Pao, but rather lower than the 1970-71 figure in which almost 50% were charged rates of 60% or more per

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37. Mekong Committee, op.cit., p.27.

TABLE VI - 16

Distribution of Interest Rates Charged by Source

Lam Pao Survey 1970-71 & 1971-72

Source	1970-1 % Per Month						1971-72 % Per Month					
	0	1-4	5	10	20	Total	0	1-4	5	10	20	Total
	No. Cases						No. Cases					
Relative	27	-	11	5	-	43	38	3	7	1	-	49
Neighbour	1	-	7	2	2	12	5	1	5	4	-	15
Merchant	1	1	2	2	-	6	-	-	1	-	-	1
Other	-	2	-	-	-	2	1	-	-	-	-	1
Total Sample	29	3	20	9	2	63	44	4	13	5	-	66

annum.[38]

If the figures are converted into amounts borrowed, it is possible to make a comparison with another recent survey made by the Mekong Committee in the Northeast region. Working in the Nongwai irrigation area, Chamlong has demonstrated that, of the total amount of money borrowed through non-institutional loans, some 42.8% was free of interest, whereas 30.9% incurred charges of over 30% per annum.[39] Table VI-17 compares these returns with the two years of survey at Lam Pao. It will be seen that, whereas the information gathered in 1971-72 corresponds closely with that presented for Nongwai, in the previous year a much higher proportion of the total amount of loan is subject to higher interest rates.

This difference, while interesting, is difficult to explain. The surveys at Nongwai and Huay Sithon were carried out a year or more in advance of the Lam Pao survey, but it would seem that in these areas there has been a more extensive development of government credit institutions than at Lam Pao. As was noted above, co-operative and bank loans make a more important contribution to the overall total in Nongwai than in Lam Pao and although Huay Sithon is in Muang district of Kalasin province, the project is heavily subsidised by government agencies and by co-operative credit organisations. It seems

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38. Ibid., Table XXI, p.27. It should be noted here that all the loans recorded in the surveys at Lam Pao and at Huay Sithon were cash loans; no lending or repayment in kind was reported. According to Fuhs and Vingerhoets, op.cit., p.54 it is common for loans in kind, repaid likewise in kind, to be charged rates of interest higher than those for cash loans - probably to guard against any intervening price fluctuations.

39. Chamlong Tohtong, op.cit., Table 17, p.26.

TABLE VI-17

Amount Borrowed by Amount of Interest Charged

Nangwai 1969; Lam Pao 1970-1 & 1971-2

(Non-institutional loans only)

Rate of Interest (per annum)	Nongwai		Lam Pao 1970-1		Lam Pao 1971-2	
	Amount (Baht)	%	Amount (Baht)	%	Amount (Baht)	%
0	20,620	42.8	15,800	35.4	31,910	59.0
0-6	4,700	9.7	-	-	-	-
6-12	8,000	16.6	500	1.0	1,800	3.3
12-30	-	-	100	0.2	1,100	2.2
30+	14,900	30.9	28,250	63.3	19,300	35.6
Total	48,220	100.0	44,650	100.0	54,110	100.0

Source: Chamlong Tohtong "Report on Benchmark Socio-Economic Survey of Nongwai Irrigation Area, Right Main Canal as of 1968 Mekong Committee, Bangkok, 1969, Table 17.

& Lam Pao Sample Survey 1970-1, 1971-2.

probable that the greater element of competition has produced the lower interest rates in these two areas and may be having the same effect in the Lam Pao project area in 1972. Again it may be significant here that the interest rates for non-institutional loans have declined at a time when there has been a notable increase in the proportion of credit supplied by the institutional sources. (Table VI-12). It might also be noted that the crop season 1970-71 was a year of particularly low crop prices in Northeast Thailand, particularly for the staple rice crop which could have made merchants unwilling to risk their capital. Certainly in both Huay Sithon and in Nongwai higher overall income levels were recorded during the respective surveys at these locations than in Lam Pao in either year of survey there and this greater capital availability may also be important in the interpretation of the lower rates of interest charged.

What is certain in all three locations is that there remains a sizeable minority of farmers requiring capital, who, because of the absence of institutional credit or the lack of credit availability among their relatives, are forced to pay very heavy interest rates on borrowed capital. These obtain their credit mainly from merchants at the village, rather than the provincial, level. Such village merchants are commonly the richer farmers in the village who, while they have capital available to lend to their fellows, have themselves only limited resources which they can ill afford to lose. For this reason they are obliged to charge rates of interest which can compensate for any default by borrowers. They recognise that the rates of interest charged on their loaned capital are high, but they feel they have no choice

in view of the risk involved. The United States Bureau of Reclamation in their study of the proposed irrigible area of the Pa Mong project confirm the problems of the village moneylender. More than one-third of these interviewed in a purposive survey reported that some of their debtors had failed to repay. Moreover, 70% of lenders reported that they themselves had borrowed funds from other sources and were therefore under repayment obligation too.[40] This was certainly the case with one such village moneylender in Ban Tum in the Lam Pao area. This man, a deputy headman of the village, had lent out a total of 3000 baht in the course of the year 1971-72.[41] From that outlay he had received interest totalling 700 baht by charging an interest rate of 5% per month . He still had a number of small loans outstanding, but most were only of a short-term nature and he expected payment after the harvest. The deputy headman had himself borrowed money to the tune of 4000 baht from the Bank for Agriculture and Agricultural Co-operatives.[42] Although this money was not used directly to finance his loan activities, it was admitted that it helped him to have more capital available for the borrowers.

The limited supply of funds available from such moneylenders and the high risk of crop loss are certainly contributary factors in the high level of village interest

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40. United States Bureau of Reclamation, "Pa Mong Project: Phase 1 Report: Volume 4, Appendix 4, Agriculture, Economics and Finance" , pp.125-126.

41. This was the smallest amount of capital recorded among village moneylenders. One farmer in Ban Lek said he had 10,000 baht available (No.46), one in Ban Na Chuak Nuea 4,000 baht (No. 95) and another (No.99) in Ban Tum 5000 baht.

42. He was village representative for the B.A.A.C.

rates. Another factor may well be the tendency, noted previously and re-emphasised in the interview above, for non-institutional loans to be strongly periodic. As Long has noted

> "Many farm loans are outstanding for less than a full year and as farm borrowing is concentrated in one period, lenders find themselves with free capital at other times of the year. Undoubtedly some of these funds are invested,...but to the extent that lenders' capital cannot be reinvested or invested only at lower rates of return during the rest of the year, they compensate by charging farmers more." 43

Such apparently high rates of interest are then scarcely a question of exploitation of the farmer by the moneylender-merchant. Most of the lenders are small village traders and are often recognised by the farmer as 'neighbours' rather than 'merchants'. Most of the lenders have limited capital which is often required by their clients for only short periods. These lenders require no collateral, they cannot supervise the use to which the loan is put and they have no powers to enforce repayment even through foreclosure on the defaulting farmer's land. They have no means of securing their capital other than through social sanction at the village level where they themselves are members of the village community. The level of interest charged is thus scarcely surprising. Although the interest rates may be criticised by the farmers, equally the lenders are recognised as contributing a service to the village community.

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43. Long, op.cit., p.127. In fact it should be noted that the actual period for which a loan is made cannot be directly related to rates of interest charged. Compensation may be made for the short period of loan, but equally the size of loan may be an important consideration for moneylenders in fixing their interest rates. The issue is complicated and Table VI-18 shows no clear pattern.

TABLE VI - 18

Period of Repayment by Interest Rate

Lam Pao Survey 1971-72

Period	Interest Rate % Per Month				
	0	1-4	5	10	Total Cases
	No. Cases				
1-3 Months	31	2	8	2	43
4-6 Months	5	1	4	-	10
7-12 Months	4	-	-	1	5
12 Months	1	1	-	-	2
Unspecified	3	-	1	2	6
Total Sample	44	4	13	5	66

It is true, however, that it is easier to charge such rates of interest where competition does not exist and where there is a shortage of capital available for investment. What does seem clear in the Lam Pao study area is that the total amount of capital which is available from non-institutional sources is rather small. Most loans are made for strictly consumption purposes. While the amount of money available may be adequate to assist the financing of temporary and mostly small-scale deficits arising from highly seasonal crises in individual farm families, it seems scarcely sufficient to finance new productive enterprises in the area. Very few loans can be said to be true 'production' loans and it is precisely these, only available from a few sources, which can be subject to the highest rates of interest.

It is certain that accelerated development of agriculture, emphasising greater land productivity and diversification of the cropping pattern will require greater capital investment. Despite recent increase in income levels with the opportunities of cash cropping and off-farm work, consumption expenditure has increased and a large number of farmers still find themselves unable to accumulate much capital over a period of years to be able to invest in agriculture. The unreliability of crop production is mainly responsible for this situation and the supply of irrigation water will certainly improve the position. On the other hand, irrigation development in itself requires greater capital investment on the part of the farmer if it is to be fully effective. Investment in land improvements such as levelling and ditch and dyke construction are necessary; higher, more regular labour inputs may increase the need to hire labour

resources or time-saving machinery; new, improved crop varieties will require more particular treatments with fertilisers and insecticides.

As farmers' confidence in the irrigation facilities grows, so it is likely that the desire to improve productivity through capital investment will increase. Initially at least such investment seems beyond the immediate resources of many. Nor does it appear that non-institutional loan sources will be able to meet the needs of farmers. In the Lam Pao survey area, between 1970-71 and 1971-72, borrowing money among farmers in the survey, increased by over 50%, but this increase has been mainly in the loans from institutional sources. The capital available from non-institutional sources remained essentially static, the traditional balancing of demand for and supply of resources within the village community.

The capital to stimulate an increase in productive investment must, at the outset, come through an injection from outside the traditional community, from institutional sources. Credit institutions must be available to meet the growing needs. They must, however, be available to all farmers, at the right time and they must offer the right kind of credit service. The work of those institutions operating in the Lam Pao area will be examined in this respect in Chapter VIII.

CHAPTER VII

PRODUCE MARKETING AND INPUT SUPPLY IN LAM PAO

In addition to the likely need for greater cash inputs on the part of the farmer in organisation of land and labour resources in the course of irrigation development, it has been suggested that farmers will require more credit for the purchase of capital inputs, such as fertilisers, new seed varieties, pesticides, water pumps and tractors. While the course of agricultural development may depend on these new investments, the extent to which a farmer will benefit is affected by the efficiency of the supply mechanism of these inputs and by their price.

At the same time, the price level of the inputs which contribute heavily to the total cost of production must be related to the ability of the farmer to sell his produce at a favourable price. Whereas irrigation water may remove some of the environmental uncertainty from the traditional system, the presence of efficient marketing channels is required to help reduce the economic uncertainty of the small farmer's position. Where new crops are introduced in the hope of diversification of agriculture, marketing channels must be available for each of these if acceptance is to be permanent. These channels must be reliable and must give the farmer the best return possible for his produce, leaving him with no feeling of being exploited. Not only should such channels exist, but the farmers should be made aware of them. In Northeast Thailand farmers have often been let down by an incomplete knowledge of the marketing system. Government

services fail to provide this even with the assistance of modern means of mass communication. Prices announced through government news sheets or over the radio often bear little relationship to those offered locally because of marketing costs and other difficulties.[1] Where such difficulties occur farmers have received minimal returns on investment and have naturally become suspicious of further commitment to commercial agriculture.

The present chapter seeks to evaluate the existing structures for the marketing of agricultural produce and for the supply of agricultural inputs in the study area of the Lam Pao irrigation project. No single system of supply and marketing exists in the area, although certain merchants do handle a number of different crops and others combine crop purchase with sale of fertilisers. In this connection Anderson[2] quotes a Ministry of Agriculture report which found that 48% of local and provincial dealers in the Northeast region handled five commodities or more, while only 21% handled only one commodity.[3] It should be noted, however, that this was a situation at a stage before the recent extension of commercialisation in the Northeast. Other merchants also offer farmers credit facilities, sometimes

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1. A comment by the District Agricultural Officer at Yang Talat is instructive here. He noted, of the government price information sheets, that farmers find them useful only for rolling cigarettes!

2. Anderson,Dole A., "Marketing and Development. The Thailand Experience", East Lancing 1971, footnote, p.87.

3. Ministry of Agriculture, "Marketing Margins and Marketing Channels of Major Agricultural Commodities and Livestock in the Northeastern Region of Thailand , 1963-64", Bangkok 1964, pp.10-11.

in return for a guarantee of the sale, particularly of the rice crop. This is not, however, the normal case, nor is it a fortunate combination of services for the farmer. The provision of credit by the merchant, usually the so-called 'middleman', can lead to large-scale debt and landlessness as it has done extensively in parts of the Central Plain,[4] when the rice crop fails. Again, the provision of fertiliser on credit usually commits a farmer to a higher price than does a straight-forward cash transaction. This point will be considered in more detail below.

Despite these various links, it is convenient to divide the consideration of marketing and supply facilities into three major sections. The long-established market system associated with the staple rice crop will first be examined; this will then be compared with the more recent structures developed to deal with the trade in such crops as kenaf and cassava; finally, some consideration will be given to the existing channels of input supplies, with particular stress on fertiliser. Although certain government agencies have begun to be active in this field, especially in regard to fertiliser, their role will be discussed further in Chapter VIII; here attention will be focused mainly on the non-institutional sector.

The Structure of the Rice Market

Clearly the most long-established product entering the

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4. Udhis Narksawasdi, "A Study of Rice Farmers' Indebtedness and Paddy Marketing in the Central Plain of Thailand", Bangkok 1959.

market in Northeast Thailand is rice. It has been estimated above that some 20% of the region's production is available for sale in any one year,[5] but it has been equally clear that not all farmers are able to contribute to this surplus. According to the findings of the Lam Pao sample survey, no more than 12.0% of the total paddy production of the 1970-71 harvest season was sold by the time of the survey; in 1971-72 the comparable figure was 22.0% and in 1972-73 20.2%. Such figures are, however, a little misleading. Most of the production of the non-staple, non-glutinous rice crop was in fact put on the market, with small quantities only being retained for making sweetmeats. In the 1971-72 crop season, 89.2% of the total non-glutinous production was sold, with large sales coming from all the lowland villages, Ban Um Mao, Ban Non Sung and Ban Lao Yai. In 1972-73 even this figure was exceeded with 92.4% sold. Here the figure derived from the first year's enumeration is strangely low at 44.8%, but this is open to explanation as will be shown below.

The proportion of the staple glutinous rice crop sold is, of course, much lower. In 1970-71 only 10.3% of the glutinous crop was sold, with 24.4% of farmers selling some of their production. In the subsequent years the equivalent figures for proportion sold were 14.3% and 14.9% and the proportion of sellers rose to 39.9% and 36.6% respectively.

The overall percentage of rice sold in the second and third years of the Lam Pao survey relates closely to the estimated surplus for the region as a whole. This is a little

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5. See above, Chapter II and Silcock,T.H. (ed.), "Thailand: Social and Economic Studies in Development", Canberra, 1967, p.235.

surprising since the Lam Pao area is mainly lowland and might be expected to record higher sales than surrounding upland areas. The very low figure of sale recorded in 1970-71 is therefore all the more remarkable. It seems unlikely that environmental conditions were such as to affect production to a major extent. It is true that in 1970-71 quite heavy rainfall produced some crop loss from flooding in the lower lying villages of the Lam Chi and Lam Phan floodplain. In Ban Lao Yai, for example, 44.1% of the total rice land was destroyed, with one farmer losing as much as 22 rai. Elsewhere, however, 1970-71 was a reasonable year and the two subsequent seasons, although there were instances of drought affecting the higher land, were rather better.

The amount of paddy recorded as sold therefore does not merely reflect the simple climatic conditions, but equally farmers' appreciation of those conditions and the state of the regional and national rice market. It seems clear that the Lam Pao sample survey, while recording the actual amounts sold, did not actually define the surplus available for sale later in the year, which in view of enumeration difficulties was not then recorded in the subsequent year's enumeration. However, Dixon, in a related study has suggested that, on the basis of calculated consumption requirements for each farm family in the survey, some 25.8% of glutinous rice production was surplus in 1970-71 and 27.5% in 1972-73.[6] He suggests that 18.2% and 14.2% were committed to store for disposal

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6. Dixon,C.J., "The Pattern of Rural Paddy Production and Consumption", Lam Pao Land Use Survey Report Series, No.5, London 1974, pp.24-25.

later in the year. This contention is supported by Usher who states that

> "At the peak period just after the harvest, at least one year's supply and probably much more is held in stock somewhere. A great part of the stock is held by the farmer." 7

The extent of this store element may be explained by two factors. In the prevailing unreliable climatic conditions in the region, farmers are reluctant to sell rice from the previous year's harvest until they are certain they will have sufficient to eat in the coming year. Indeed, in particularly vulnerable villages, it is possible that farmers in a year of good harvest will retain much more than the single year's consumption needs. This was certainly the case in Ban Lao Yai where villagers expected substantial crop loss in at least two years out of three and duly took the precaution in a good year, such as was 1971-72, of storing up to two years' rice supply.[8] The large rice barns in this village were particularly notable.

The second cause for the significant store of paddy relates to the price of rice. This is probably the explanation for the very low percentage of rice sold, particularly of non-glutinous rice, and the small numbers of farmers involved in the immediate post-harvest period in 1970-71. In that year the average price received for glutinous rice throughout the period of sale by farmers in the Lam Pao sample survey was 0.51

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7. Usher, Dan., "The Thai Rice Trade", in Silcock (ed.), op.cit., p.214.

8. Even this can be insufficient and in fact 1970-71 seems to have been a third poor year in succession for Ban Lao Yai, forcing many members of the village to search for wage labour as far afield as Phichit. It is notable that despite the good yields (344 kgs./rai) in 1971-72, no glutinous rice was sold and clearly stocking up was taking place.

baht per kilogramme; in the following year it rose to 0.62 baht per kilogramme and in 1972-73 to just over 1.0 baht per kilogramme. The 1970-71 non-glutinous rice price was equally low. Farmers expressed dissatisfaction with the low prices current in 1970-71 and some were hanging on for a better price later in the year.

This is a tactic followed by a number of farmers in any circumstances. It is, naturally enough, at harvest time when seasonal rice prices are at their lowest as the available supplies reach their peak. Thus it is advantageous for those who are able to do so to hold back their paddy from the market until the price increase in the off-season. Figure VII-1 shows that whatever the overall trend in paddy prices there is a clear cyclical movement in which price increase away from the harvest season to reach a peak just before the new harvest is due.

Usher sees the storage of paddy to await better prices as a normal situation:

> "Some farmers prefer not to sell this surplus paddy all at once after the harvest but to hold it back until the price goes up later in the year." 9

but observation in the Lam Pao area suggests that few farmers have both the capacity for storage and the financial position to hold back their rice for long. It is moreover rather more difficult to sell small quantities of rice in the off-season when dealers, unless they are seeking to make up specific orders, are rarely interested in odd small amounts. Where holding back does occur, farmers tend to sell pre-harvest in the knowledge that the new crop is secure and that it will need

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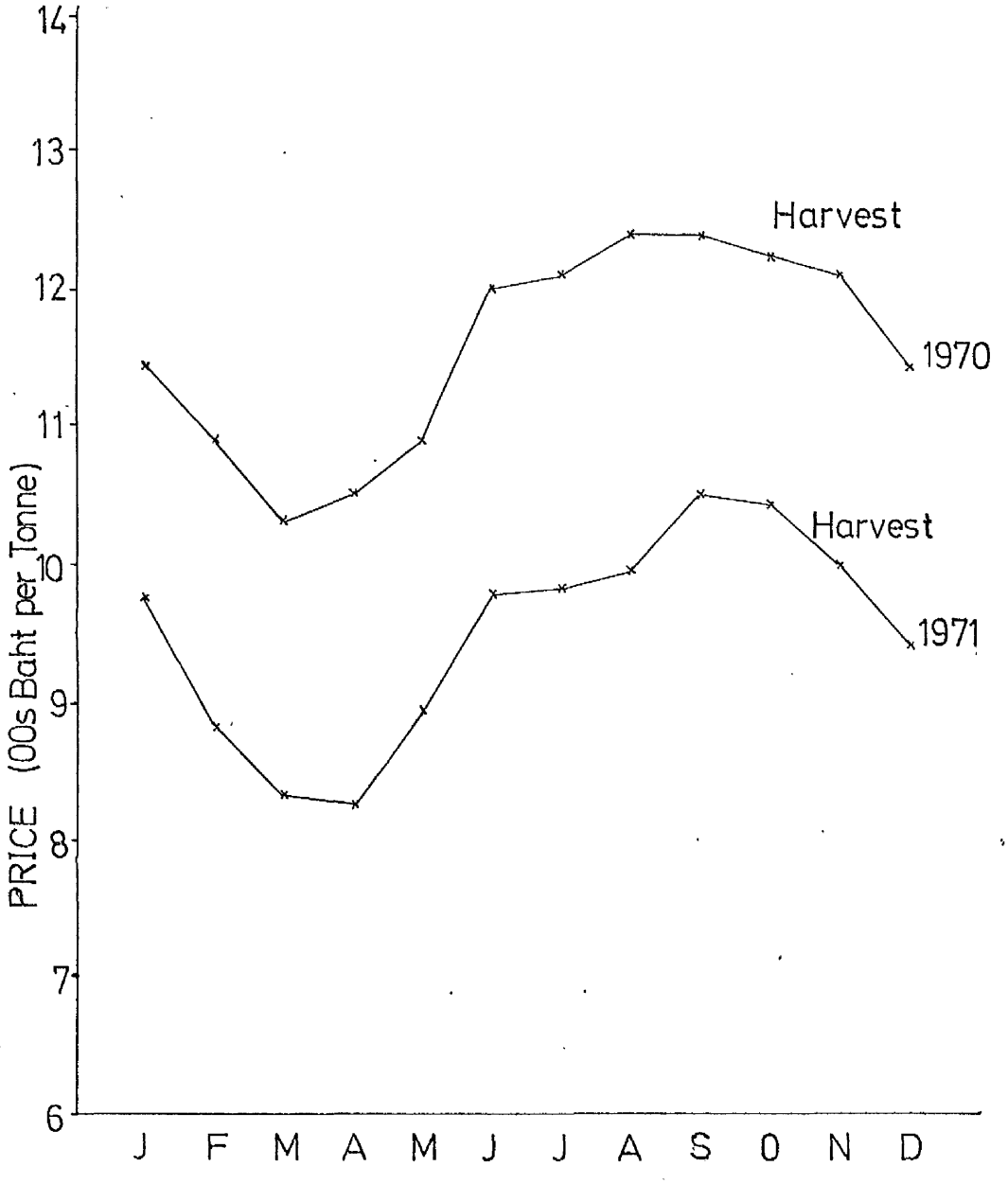
9. Usher, op.cit., p.214.

FIGURE VII - 1

MONTHLY MOVEMENTS OF PADDY PRICES
(BANGKOK WHOLESALE PRICE - NON-GLUTINOUS RICE)



Source : Bank of Thailand Monthly Bulletin

TABLE VII - 1

Sale of Glutinous Rice by Month

Lam Pao Sample Villages 1971-2

	1971 2514 July	Aug.	Sept.	Oct.	Nov.	Dec.	1972 2515 Jan.	Feb.	Mar.	April	May.	June	
	No. Cases												
BAN NA CHUEAK	-	-	-	1	1	-	1	8	7	1	1	-	20
BAN TUM	1	-	-	-	-	3	2	3	5	3	1	-	18
BAN UM MAO	-	-	-	1	-	-	3	9	6	1	-	-	20
BAN FAI TAEK	-	-	-	-	-	-	1	-	-	-	-	-	1
BAN LEK	-	-	-	-	-	1	3*	6*	5*	7	-	-	21
BAN NON SUNG	-	-	-	-	-	5+	5	5I+	5I	-	-	-	18
	1	-	-	2	1	9	15	31	28	12	2	-	98
Amounts (Tonnes)	1.0	-	-	1.52	0.5	11.1	24.6	46.98	37.45	9.3	2.5	-	134.9

*+I Individual farmers selling in more than one month

space in the rice barn. Moreover it does not appear that most farmers do hold onto their rice. Records of date of sale in the Lam Pao sample survey suggest that most farmers require an immediate cash return, some of them to clear off existing debts.

Tables VII-1 and VII-2 record the dates of sale of rice in the first two years of the Lam Pao survey. While it is recognised that there may be some under-enumeration of the pre-harvest sales, the bulk of sales in either year takes place immediately after the harvest. In 1971-72, a year of later harvest, there is a very strong concentration in the months January-April with the earlier sales concentrated in the Lam Chi flood plain site of Ban Non Sung. In the previous year there was a rather wider spread, reflecting perhaps the search for a better price away from the harvest peak of December-February. Here the rather greater incidence of September sales may be noted and their large average size suggests that these may have been made by the richer farmers holding out for the seasonal price rise. On the other hand small-scale sales of rice do go on throughout the year by families feeling the immediate need for cash, usually for consumption or emergency household expenses. It may be that the rice sold is drawn from the intended subsistence supply, so that it is not unusual for a family so doing to borrow money at a later date to satisfy its subsistence needs.

Sale of rice, then, in the Kalasin area is a very complex matter, dependent upon a whole series of factors affecting individual households. The market system is a complicated organism and it requires an equally sophisticated organisation to administer it. Such a system has indeed

TABLE VII - 2

Sale of Glutinous Rice, by Month

Lam Pao Sample Villages 1970-1

	1970 2513 September	October	November	December	1971 2514 January	February	March	April	May	
	No. Cases									
BAN NA CHUAK	1	-	-	2	-	1	-	3	2	9
BAN TUM	-	-	1	-	-	1	-	-	5	7
BAN UM MAO	1	-	2	4	2	7	3	-	-	19
BAN FAI TAEK	1	1	-	-	1	1	1	-	-	5
BAN LEK	-	-	1	5	1	-	-	2	1	10
BAN NAN SUNG	2	-	-	-	1	3	1	-	1	8
	5	1	4	11	5	13	5	5	9	58
Amounts (Tonnes)	11.9	0.1	1.74	10.23	6.5	20.0	11.0	9.0	12.2	83.74
Average/Sale	2.38	0.10	0.43	0.94	1.3	1.54	2.2	1.8	1.36	

developed in the relatively short period since the penetration of the market economy into the central part of the Northeast region, following the extension of the railway to Ban Phai and Khonkaen in 1933. Silcock suggests that rice marketing in this area is no older than 30-40 years[10] and dates of foundation of the major rice mills in Kalasin town seem to correspond with this suggestion. The oldest of the mills in the town is registered as being founded in B.E. 2483 (1940), a date confirmed by the mill's assistant manager.

Despite this short period of development - a development further retarded by the Japanese invasion of Southeast Asia - the mechanism of the rice trade in the Kalasin area is very well lubricated. Although it may be that the whole organisation of the rice trade in the Northeast is controlled by a single firm or a small group of companies in Bangkok, the situation at the provincial level is of great complexity. Trading in Kalasin province is in the hands of three groups of people: first, the owners of large rice mills in the market centres of Kalasin and Yang Talat,[11] and at a further remove, of Khonkaen; second, the local traders, sometimes called 'middlemen', whose enterprises vary in scale and who may or may not be directly associated with the rice mills in the neighbourhood; third and probably least important, the village-level rice miller. Each of these have their particular part to play in the system.

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10. Silcock,T.H., "The Economic Development of Thai Agriculture", Ithaca 1970, p.149.

11. The other district centre in the irrigation area, Kamalasai, is generally by-passed in the system. The major mill there is relatively small. Most surplus rice from the district goes to Yang Talat, Kalasin and quite frequently direct to Khonkaen.

Most villages in the Lam Pao irrigation area have their own small rice mills. Of the seven villages chosen for intensive study, none is now without at least one mill following the construction of a small mill in Ban Lao Yai in 1973. At Ban Tum, indeed, there are now 4 mills serving the population of some 270 households.[12] The mills are often of considerable vintage, although their exact age is difficult to ascertain since local registration of industrial premises seems to have been rather haphazard until 1965 when a sudden drive led to a spate of registrations. These establishments have little to do with the actual spread of commercial rice marketing, their development having depended rather on the increasing availability of imported milling machinery.

At their foundation, as at the present time, these local rice mills were meant to replace the traditional foot-worked 'pestle and mortar' mill. Millers tend to charge a single baht for each ten-kilogramme basket milled and thus, even in a small village they have a reasonable daily income.[13] The mill performs an essential service to the village and a break-down can cause considerable inconvenience as was shown by the unreliable performance of the mill at Ban Um Mao in 1972.[14]

Such is the staple trade of the village rice mill; its entry into the actual rice trade is very much a sideline.

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12. There seems to be a threshold level of some 60-80 families capable of supporting a 8-10 h.p. mill.

13. Although some mills actually mill free and gain their profit from the sale of bran for animal fodder. (6-8 baht/kg. in 1975).

14. Villagers had to make the lengthy journey to the next village and frequent spillages were observed as young girls found the heavy baskets too much for them.

Local mills have very limited storage capacity and as a consequence can purchase only small amounts of grain at any one time. Again, they possess only limited contacts within the trade and ultimately they sell to larger merchants or millers in the town, so that it is likely that the farmer will receive a lower price by introducing another link in the market chain. Thus the chief function of the local miller in the rice trade has been largely what might be called 'sales of convenience', involving small amounts of paddy mainly in the off-season. He will buy from farmers requiring small amounts of cash rapidly, where the normal merchant is unavailable or where amounts are not worth the cost and inconvenience of transportation to the larger centres. In that the larger mills prefer to receive their supplies unmilled, he may act simply as an ordinary local trader.[15]

Despite the usually small amounts involved in the individual transactions, it would appear that overall the local millers' contribution to the trade is quite significant. The major rice mill in Kalasin town reported that some 20% of its supplies came from the village millers, which represents a substantial service to their communities throughout the year.

In comparison with the share of small millers in marketing, however, the amount of sale direct to large urban mills and made through merchants at the village and district level is much more important. At Kalasin millers estimated that each of these channels supplied them with 40% of their purchases. These figures may be compared with those drawn

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15. Because the larger mills are more efficient and have a smaller percentage of broken rice.

TABLE VII - 3

Glutinous Rice: Channel of Sale
Lam Pao Survey Villages 1971-72

Village	Buyer					
	Consumer In Village	Village Merchant	Outside Merchant	Village Miller	Town Miller	Total Cases
	No. Cases					
BAN NA CHUAK NUEA	4	8	4	-	4	20
BAN TUM	4	14	-	-	-	18
BAN UM MAO	1	1	3	2	13	20
BAN FAI TAEK	1	-	-	-	-	1
BAN LEK	-	1	13	-	7	21
BAN NON SUNG	2	14	2	-	-	18
BAN LAO YAI	-	-	-	-	-	-
TOTAL SAMPLE	12	38	22	2	24	98

by Anderson from the 1964 Ministry of Agriculture report and which are produced in Figure VII-2. Here apparently some 23% of paddy was disposed of via local millers or through direct sale to consumers, while 38% was channelled through local, village-level merchants and 39% direct to large millers of middlemen in the district or provincial centres.[16]

The evidence from the Lam Pao sample survey broadly confirms the findings already presented. Here, because of the greater detail derived from the 1971-72 enumeration, these data are used in illustration. As may be seen from Table VII-3 and Table VII-4, channels of sale differ from village to village. The dominance of sales to merchants and large town mills is, however, clear in all cases. Only in Ban Um Mao were there any sales direct to village millers and even sales to fellow villagers constituted no more than 12% of the total. Clearly the proximity of the villages to the major market centre at Kalasin is the most important factor influencing channels of sale. Thus from Ban Um Mao and Ban Lek farmers take their rice into the town and sell there direct to merchants or millers. On the other hand, in Ban Na Chuak Nuea, Ban Tum and Ban Non Sung, the greater distance causes the farmers to rely on local merchants, both resident in their own community and coming from outside.

Table VII-3 indicates that over 60% of the cases of rice sale in the Lam Pao survey for 1971-72 pass through the hands of merchants. With the exception of Ban Lek, where sale is through an urban middleman with storage facilities just outside

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16. Ministry of Agriculture, op.cit., (1964), quoted in Anderson, op.cit., p.87.

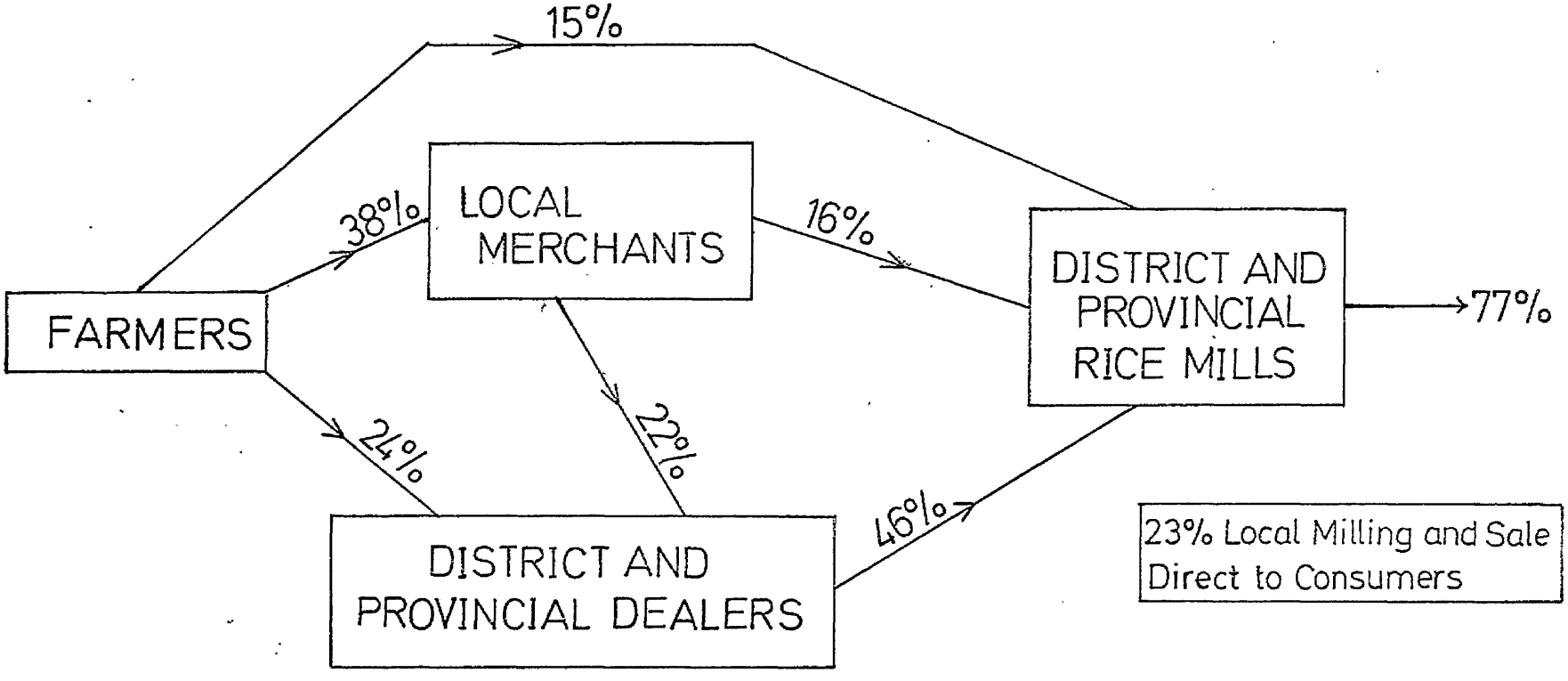
TABLE VII - 4

Glutinous Rice: Point of Sale
Lam Pao Survey Villages 1971-72

Village	Place				Total Cases
	Own Village	Kalasin	Yang Talat	Elsewhere in Northeast	
	No. Cases				
Ban Na Chuak Nuea	16	4	-	-	20
Ban Tum	18	-	-	-	18
Ban Um Mao	4	15	1	-	20
Ban Fai Taek	1	-	-		1
Ban Lek	2	19	-	-	21
Ban Non Sung	16	-	1	1	18
Ban Lao Yai	-	-	-	-	-
Total Sample	57	38	2	1	98

FIGURE VII-2

NORTHEAST THAILAND : CHANNELS OF RICE SALE



after Anderson

the town on the road to the village, these merchants either live within the village itself (63%) or come to the village from outside (8.5%). They may be agents of larger traders based on the district centres or may sell direct to mills in their own right.

Whether these merchants are village residents or not, they have been the subject of great controversy in Thailand. It is these 'middlemen' who are held in various quarters to be the villains of the Thai rice trade, preventing the efficient operation of the trade and exploiting the farmer by preventing him receiving the full fruits of his labour. The Thai government have been particularly fond of condemning such people:

> "'Middlemen', the Minister said, 'have caused economic instability among farmers, which is a reason why our farmers have been in difficult circumstances'" 17

On the other hand, other writers have maintained that these merchants are carrying out a vital service for the economy and are entitled to adequate reward for that service. On the question of exploitation, Usher is quite clear:

> "If exploitation means that farmers are getting less for their products than they would under a reasonably efficient publicly operated distribution system, then I doubt very much that the rice farmers are exploited." 18

and Muscat, while noting the standard government line also contends that profit margins are very small.[19]

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17. H.S.H. Prince Sithiporn Kridakara, "Some Aspects of Rice Farming in Siam", Bangkok 1969, p.160, quoting the then Minister of Agriculture, M.R. Chakthong Thongyai in the Bangkok Post of 26 April 1969.

18. Usher, op.cit., p.223.

19. Muscat,R.J., "Development Strategy for Thailand", New York 1966, p.99.

Evidence gathered in the Lam Pao irrigation area and in adjacent areas in the Northeast seems to indicate that the latter view is nearer the truth. One thing is certain, namely that such 'middlemen' can have no control of the overall price of rice, so that any profit they make is marginal to the rise and fall of international and national rice prices. Even at the provincial level, it is the large rice millers who are able, by agreement amongst themselves, to manipulate prices at the local markets. The middlemen, by contrast, do not control large enough supplies, nor are they sufficiently co-ordinated at the district-level to achieve this. They are themselves dependent on the next highest rung in the merchandising ladder for the price at which they sell their acquired stocks and the larger millers maintain that the same price is given to middlemen, village millers and individual farmers alike. It is possible, on the other hand, for the district-level merchants to play the market and consign supplies to mills wherever the market price is highest. Telephone communications within the Northeast have recently made this much easier and one large trader noted that in 1973 he had been sending a lot of rice as far as Muang Phon in Khorat province and to changwat Chaiyaphum, where there had been a serious drought in the previous crop season.

The real question mark against the middlemen, both at the village and at the district levels, is whether the return they take on their services is too high and whether they exploit the farmer's poor bargaining position in any other way. These latter practices might include linking the purchase of rice with other services, such as fertiliser supply or credit in order to guarantee the future sale of rice or the question of 'green-crop sale' of the production of farmers in particularly

poor financial position.

Extensive enquiries were made on such points in the Lam Pao area without uncovering any major degree of exploitation. Farmers freely admitted that 'green-crop sale' did occasionally exist in their village, but individuals never confessed that they themselves had been forced to follow such a course. The survey questionnaire did reveal a number of cases where sale had taken place prior to harvest, but these were rather the phenomenon noted earlier of holding over the previous year's crop for sale when prices improved.

Among the village traders interviewed, most of whom seemed to be agents for district-level middlemen or millers, there were few signs of exploitation of their fellow villagers. Indeed it would be surprising if this were the case. Most traded exclusively in their village of residence and were usually farmers themselves. As members of a community, they would be open to the sanctions of that community if any malpractice were suspected. It appeared that the profit margin on their trading was very small indeed and that some were fulfilling the function of bulking their neighbours produce ready for convenient sale.

Enquiries in Ban Non Sung in 1973 revealed a trading network consisting of two groups of farmers. One farmer resident in the village (list no.21) was in partnership with the son-in-law of the village headman (no.1); the second group was composed of three young men, members of families nos. 20, 73 and 128, who acted as agents in Ban Non Sung for a rather larger trader in the adjacent tambol centre of Ban Nong Paen. Although these two groups competed for supplies, both were in fact agents of a single large-scale merchant in

Kalasin town. Both groups gave a similar and quite independent picture of their activities. Farmer no.21 said that he had sold eight truck-loads of paddy in the course of the year, mostly during the period immediately after the harvest. Each truck-load had contained about 100 bags of about 80 kilogrammes per bag. Farmer no.128, speaking for the Ban Nong Paen merchant, reckoned that in all he had made about 20 trips to the Kalasin middleman's centre in the season with between 50 and 100 bags in the lorry on each trip. Taking an average figure of 75 bags, this group had sold about 120 tonnes during the year against the other partnership's 64 tonnes.

Both merchants gave the same indication of their profit margin. Over the course of the year the price had fluctuated considerably, but taking an average, they had bought paddy in Ban Non Sung and other surrounding villages at 10.0 baht per tang[20] and had sold it to the Kalasin merchant at an agreed commission of 0.5 baht per tang. The trucks were sent on request by the Kalasin firm, which also provided the sacks, so that the village merchants did not have to pay any of these costs. It should be noted that the overall profit was split between the members of the partnership in each case.

These village traders maintained that they did not lend money to help secure supplies, but both said that they also traded in fertiliser. This clearly assisted their paddy purchasing operations for the questionnaire survey enquiries in Ban Non Sung uncovered two families who had had to sell rice in the month of July in order to raise the capital to

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20. A measure of capacity, roughly equivalent to 10 kilogrammes of paddy in weight, but see below.

pay for their fertiliser. In one case, that of an old lady household head, this meant that her family had insufficient rice to eat for the remainder of the year. Fortunately she was able to obtain supplies free from her relatives in the village. A similar, but less fortunate, case was revealed in Ban Na Chuak Nuea. This farmer appeared to be in great difficulty. He wished to apply fertiliser to his paddy crop early in the season and obtained supplies on credit from a merchant in Ban Huay Toei, a nearby upland village outside the irrigation area. To pay for the fertiliser he had to sell rice to the same merchant, although his normal yield was scarcely sufficient for his family consumption requirements even at a low level. It was almost certain that he would have to buy rice and in the following March and April was labouring at the Lam Pao dam site to supplement his income for this purpose.

These cases of misfortune assist the merchants to obtain their rice supplies, but they cannot be described as exploitation. In Ban Non Sung, it was possible for the two cases to have obtained the fertiliser on credit terms; they chose not to do so because of the higher cost of credit purchase. Nor can the reduced credit price for fertiliser offered by one Ban Non Sung merchant to those who sold rice to him be described as other than businesslike.[21]

The method of operation of the larger middlemen may or may not involve such village agents and as a whole is more difficult to assess. It is clear that such merchants do gain profit from their market knowledge and from their ability to

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21. See below.

store rice to take advantage of better prices away from the harvest peak, but their market knowledge is at the same time performing a service to the areas of shortage. At the village level they operate in much the same way whether or not agents are involved. Most have their own transport, either a small pick-up truck or a larger ten-wheel lorry, which are sent to the villages to collect the rice. In saving the villager the cost of transporting his own rice, their price at the farm, including that passed on to their agents, is usually lower than that paid to a farmer carrying rice himself and paying his own transport to a large urban mill. Large mills collecting rice directly from the village make a similar reduction, usually in the order of 4-5 satang per kilogramme (0.04-0.05 baht).

It is the operations of such large merchants which have usually been the centre of accusations of malpractice, but there seems little reason to suggest that they seriously cheat the farmer. One merchant in Kalasin assessed his profit as 2 satangs per kilogramme and he also provided sacks and transport free of charge; another only operated through village agents who had to supply the sacks themselves. Both the merchants were accustomed to measure the rice in the villages by the tang measure and then sell it off to the large millers by the kilogramme. Here it seems there may be some method by which the farmer can be exploited, and Muscat quotes Udhis in the belief that through buying by volume and selling by weight merchants profited to the tune of between 4 and 15% of the volume.[22] On the other hand it seems certain

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22. Muscat, op.cit., pp.99-100, quoting Udhis, op.cit.,p.315, but the latter also notes that they must guard against loss of stock to rodents, etc.

that most of the middlemen's profit comes from playing the market.

The role of the larger urban mills in rice marketing has already been partially considered above. They act in an essentially similar manner to the large-scale merchants. Most have their own trucks and charge for the cost of transportation, like any other merchant, although their contacts and knowledge of the presence of local surpluses are not usually as wide as those of the large middlemen. Most of their supplies are drawn direct from village merchants or from the middlemen, although Dixon has noted that there is a seasonal variation in the sources of supply. In the harvest peak period supplies are mainly collected via the village agents; later in the season most is purchased from the middlemen who have stored paddy against the seasonal price.[23] The large mills maintain large storage facilities themselves and it is by this means that in syndicate they are capable of altering the supply situation at the changwat or even sub-regional level to raise and lower prices. It is through them and their agents in Bangkok that orders in the international and national markets are translated into local demand.

At the local scale, these regional rice millers are generally dependent on the mobilisation of surplus supplies by the village merchants and middlemen. Overall each has a role to play in the marketing system. The whole is a system of great complexity, but capable of rapid response to external

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23. Dixon,C.J., "Markets, Marketing and Agricultural Change in North East Thailand", I.B.G. Developing Areas Study Group Conference, London 1974, p.6.

market changes. Despite the accusations of exploitation of the farmer, the cost of the marketing services does not appear very high. Usher has estimated that the combined profits of miller and merchant only contribute about 4% of the total price of a ton of paddy sent from the Central Plain to Bangkok and that the farmer receives 79% of the Bangkok selling price for the white rice equivalent.[24] He has also suggested that the Northeast farmer would get a rather lower but quite substantial 74%.[25] According to Udhis, again writing of the Central Plain

> "..the farmers get as their share approximately 72.19% of what consumers pay for their rice and..the service charge of the wholesalers and retailers of all categories is approximately 12.05%." [26]

Conversations in the Kalasin district suggest that the first stage of merchant handling only results in a mark-up of some 7-10%, a small price to pay for the difficulty of communication with a mass of small farmers, mostly with a small and irregular surplus. As a whole constituent elements of the rice trade form an efficient marketing channel, which, as Sithiporn notes, would be difficult to replace.[27]

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24. Usher, op.cit., p.221.
25. Ibid., p.222.
26. Udhis, op.cit., p.330.
27. Sithiporn, op.cit., p.162.

The Structure of the Kenaf Trade

The development of kenaf marketing in Northeast Thailand is of even more recent vintage than that of the rice trade. The rise of kenaf as a commercial crop dates from the late 1950s and, as might be expected from its comparative novelty, the trade shows marks of lesser sophistication than the rice marketing system. During the 1960s the wild fluctuations of the Thai kenaf market in response to world market forces have made the establishment of a stable market system difficult to achieve.

Just as the climatic conditions of the area and the response of individual farmers to them affect the working of the rice trade in the Northeast, so also do these affect the kenaf market. The upland kenaf crop can suffer particularly from drought damage and is also highly susceptible to insect pests. Regional and provincial records of crop loss on upland crops are difficult to obtain and of doubtful reliability, but one estimate gives a low figure of 2.5% of planted area actually lost in 1968 for the whole of the Northeast, but as high as 7.7% for Kalasin province.[28] Among growers in the Lam Pao sample survey some 17.5% of planted area was lost in 1970-71 and 11.7% in 1971-72. Substantial areas are able to be harvested but are also damaged to some extent by various agencies.

Overall, however, the damage caused to the kenaf crop has not affected the trade as much as has the violent price

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28. Department of Agricultural Extension, Ministry of Agriculture, "Satiti Karn Pluuk Phuet Rai Le Phuet Phak, 2511", Bangkok 1971, pp.97-136.

movements and the farmers' response to them. As was suggested earlier, kenaf is supplementary to the basic subsistence rice economy and the farmer can easily enter into, or back out of, kenaf cultivation as the profitability of the enterprise rises or falls. Behrman, in noting the sudden entry of many farmers into kenaf production in the period 1960-61, has suggested a very strong responsiveness to price movement.[29] Farmers tend to decide on the extent of their participation in kenaf cultivation in any one year on the basis of the price current in February or March at the time of planting. They are aware that the price does fall as the new harvest comes on the market, but the level of the planting period does tend to reflect the state of the world market. On the other hand, they are at risk in that the jute crop from India and Bangladesh comes onto the market before Thai kenaf and the arrival of this new crop can mean that harvest prices bear little relation to those at planting. This has led Chaiyong et al. to note that

> "..variations in production bear little relation to fluctuations in price (suggesting) that increasing popularity of the crop as a boost to farmer's income prevailed over any true elasticity of supply." 30

but this may be an overstatement of the case as may be seen from Figure VII-3.

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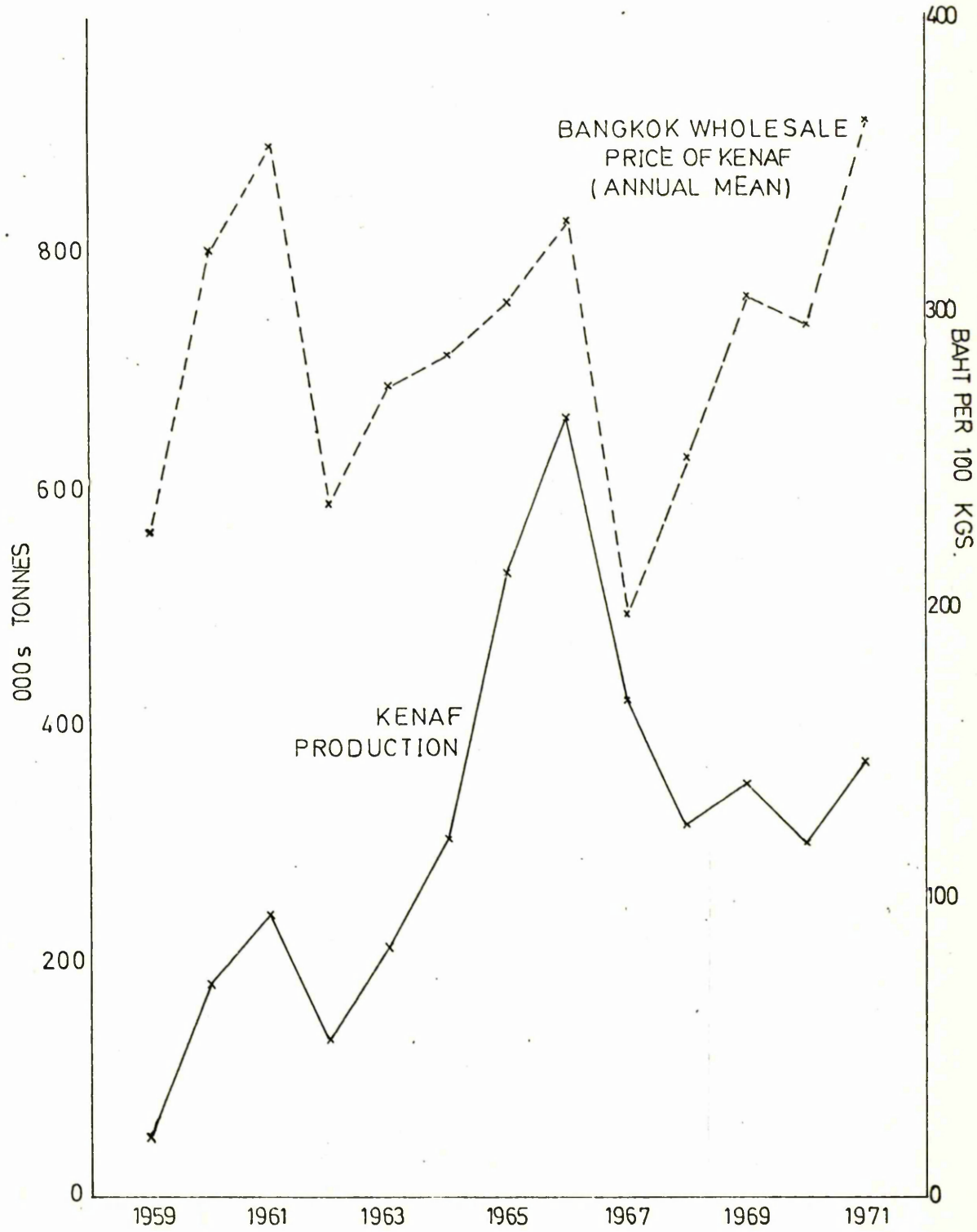
29. Behrman,J.R., "Supply Response in Underdeveloped Agriculture: A Case Study of Four Major Arrival Crops in Thailand, 1937-1963", Amsterdam, 1968, pp.144-145.

30. Chaiyong Chuchart, Norman L.Wake and Sachee Suthasathien, "An Economic Study of the Production and Marketing of Thai Kenaf", Bangkok 1967, p.7.

FIGURE VII-3
KENAF : ANNUAL PRICE AND PRODUCTION LEVELS 1959-71



Source : Bank of Thailand Monthly Bulletin

Whatever the relationship between price fluctuations and levels of production, there have been large differences in the amount of kenaf entering the market over the years. Moreover the area of supply has also changed in the course of a decade. Originally kenaf was developed in the three provinces of Nakorn Ratchasima, Chaiyaphum and Mahasarakham; in 1959 these accounted for over three-quarters of the country's production.[31] Since then other provinces have become more important, with Ubon Ratchathani becoming the chief producer in 1960 and Khonkaen in 1965. Planted area in these newer provinces has, however, tended to fluctuate more wildly than in the original centres and this, like the effect of price movements has tended to affect the development of the trade. (Table VII-5).

As a fibre crop, kenaf is naturally put on the market wherever possible. Only in exceptional circumstances is the farmer's crop not sold. If it has been badly damaged, it may be that the farmer may feel that the heavy labour input involved in cutting and processing is not worthwhile for an insignificant return, especially if prices are low. In such circumstances, the crop is left in the field for seed or even fed to the farmer's livestock. This problem does not affect most cultivators. Rather are the main difficulties involved with cutting the kenaf at the time of the highest fibre content and preserving its quality during the processes of retting and stripping.

It is generally considered that kenaf fibre yields are

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31. Behrman, op.cit., pp.144-145.

TABLE VII - 5
Kenaf: Area Planted
Northeast Changwats 1960-1971.

Changwat	1960	1961	1962	1963	1964	1965	1968	1969	1970	1971
					(000s Rai)					
Kalasin	72.0	166.4	106.2	71.5	63.4	86.0	40.8	165.0	74.0	101.7
Khonkaen	78.0	105.5	96.8	126.2	299.4	499.3	216.1	321.4	380.7	302.7
Chaiyaphum	92.0	218.3	110.0	158.6	178.3	379.0	211.1	266.0	257.2	314.3
Nakorn Phanom	1.0	32.4	12.0	11.3	10.1	30.8	35.1	28.9	24.5	33.5
Nakorn Ratchasima	95.0	200.2	58.2	120.4	169.6	260.3	58.7	168.7	160.5	258.0
Buriram	13.0	146.3	94.0	48.0	63.5	89.0	29.6	55.7	117.7	167.4
Mahasarakham	153.0	353.0	121.9	211.8	216.4	427.6	196.8	385.4	378.4	383.6
Roi-Et	40.0	46.3	12.1	27.4	38.6	78.4	78.6	9.8	9.8	106.5
Loei	1.0	1.0	0.8	0.7	6.4	25.9	14.3	12.0	2.7	34.3
Sri-Sa-Ket	83.0	99.9	34.5	31.2	58.2	94.9	211.3	90.4	106.3	137.0
Sakol Nakorn	8.0	8.9	3.3	1.3	1.1	4.9	0.3	6.1	6.0	23.2
Surin	0.4	2.0	11.9	6.7	26.4	65.8	17.3	36.9	90.1	100.0
Nongkhai	0.2	25.0	2.3	5.0	2.5	4.7	2.8	3.8	4.9	6.1
Udorn Thani	2.0	33.5	21.3	23.3	38.2	79.6	55.1	93.7	92.9	103.5
Ubol Ratchathani	218.0	193.1	6.5	81.5	165.4	240.0	261.2	266.0	151.9	126.2
Total	855.6	1631.8	691.8	924.9	1337.5	2366.2	1429.1	1909.8	1857.8	2197.9

Sources: 1960-65 Silcock, T.H. "The Economics of Thai Agriculture" Ithaca 1970, Table 4:6, p. 79.
1968,1969, 1971 Department of Agricultural Extension, "Satiti Karn Pluuk Phuet Rai Le Phuet Phak" 2511, 2512, 2514 Bangkok.
1970 Department of Agricultural Extension "Phaen-Thii Songserm Karn Kaset Phak Ta wan-ork Chiang-nuea 2515-2519", Bangkok 1972.

highest if the plant is cut immediately after flowering.[32] It has been noted above, however, that since kenaf is secondary to rice in most farmers' estimation, it is common to cut the crop at whatever time is most convenient in terms of the rice harvest. For this reason, many farmers cut the kenaf before flowering so that they are able to process the fibre before the time of the rice harvest. By doing this they also have the advantage of adequate supplies of retting water at the end of the rainy season, they may be able to secure higher prices in the immediate pre-harvest period and they may be able to obtain supplies of much needed cash.[33] By adopting this strategy the farmer may lose a little in fibre content but gain in quality and price.

If this strategy is impossible, the farmer can lose out in a number of ways. If he has insufficient time after cutting to complete the processing of the kenaf before the rice harvest, he must leave it unharvested in the field, for, in terms of fibre quality and ease of stripping,

> "It is very important to remove the stalks from the water at the end of the retting process for stripping at the correct time ...Under normal circumstances, the critical time period during which the fiber (sic) is at its optimum stage of retting is quite short, not more than 24 hours in most instances" 34

It is quite possible for the farmer to cut his kenaf crop in two parts, processing some before and some after the rice harvest, but any of the crop left until this second period is likely to suffer in quality.

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32. Sholton, Erwin, "Kenaf In Thailand", Bangkok 1968, p.36.

33. Sholton, op.cit., p. 40.

34. Ibid., p.228.

The fall in quality will result not only from leaving the crop in the field after the optimum time for cutting but also from the difficulties which may be encountered in retting. As Sholton notes,

> "The retting water problem assumes serious proportions almost everywhere in the Northeast by the end of November" 35

In the Northeast, kenaf is retted in a variety of situations. Some farmers actually dig pits into which they throw the kenaf in bundles, either attaching the bundles to stakes or weighing them down with stones or mud. More common, however, is the use of local water resources in the form of ponds or small pits; a typical location in the Kalasin area is the borrow-pit at the side of a district-level road. Yet others are accustomed to soak their produce at the side of their paddy fields and in small streams. Agarwal, working in changwat Chaiyaphum, noted that 32.3% of farmers interviewed used their own or their neighbour's purpose-built ponds, 25.8% used lakes or communal ponds, 19.3% used the river, while the remainder had a variety of other resources.[36]

The nature of the retting location can have a significant effect on the quality of fibre produced. If the water is not sufficiently deep, as is likely in borrow pits and at the sides of paddy fields, the kenaf fibre is liable to deteriorate with contact with the mud. This is more likely late in the season when the water sources are beginning to dry up. At this time, moreover, even the purpose-built retting

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35. Ibid., p.191.

36. Agarwal,M.C., "Co-operative Marketing of Kenaf in Thailand - A Case for Vertical Integration", Bangkok 1971, p.19.

pits will be lower in water level and are likely to contain long-stagnant and polluted water, especially if some kenaf has been retted there at an earlier date. In addition the quality of the fibre can be affected by the method of retting; if the kenaf is weighted down by mud or stones, rather than being attached to stakes as is preferable, then it is probable that the fibre will be stained and thus lose quality.

Considerations of fibre quality, time of sale and the fluctuation in the production of the crop all have their effect on the administration of the kenaf trade in Northeast Thailand. The movements in production mean that it is difficult to know from year to year just where supplies are available. The problem of processing time means equally that a certain amount of local knowledge is required to acquire the supplies. This creates difficulties, as with the rice trade, for the large-scale provincial merchant and miller. He must similarly rely on local merchants, at both the village and district levels, to obtain his supplies. On the other hand, this reliance on a multitude of small traders does pose problems for grading the fibre consistently and in such a way that the farmer gets the benefit of careful husbandry.[37] These points will be born in mind in considering the structure of kenaf trading in the context of the Lam Pao irrigation area.

As was noted above, in the Lam Pao sample survey, some 60% of all farmers cultivated kenaf in the first two years of enumeration. As with the rice trade, in this section, data will be taken mainly from the 1971-72 crop season in which the breakdown of information on the market structure was more detailed.

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37. Chaiyong et al., op.cit., p.4.

Table VII-6 indicates that most sales of kenaf take place at the seller's village of origin. Out of 144 cases for which data were recorded in 1971-72, 112 cases were carried out in the farmer's own village and only 32 outside. The direction of sale parallels closely that encountered for the rice trade, with those villages nearer Kalasin, especially Ban Lek, tending to take their produce to Kalasin. Some kenaf from the southern villages was brought to Yang Talat, in one case because the merchant in question was also the buyer for the farmer's kapok. An interesting phenomenon of the kenaf trade was the incidence of two groups of farmers, one in Ban Na Chuak Nuea and one in Ban Lek, who combined to take their produce direct to the regional centre at Khonkaen and secured a higher price for doing so.

Unlike the situation in the local rice trade, there is no processing centre for kenaf at Kalasin, nor indeed in the two next nearest provincial centres, Mahasarakham and Roi-et. The major jute mills in this central part of the Northeast are concentrated at Khonkaen and here also, as well as at the nearby railway town of Ban Phai, are located most of the kenaf baling plants. Such establishments have grading facilities and they offer a price which does not incorporate a reduction for transport costs. It has been these considerations which have encouraged the farmers in question to take their kenaf fibre direct to Khonkaen for sale to the mills or their agents. In Ban Lek interviews revealed that about 10 farmers had put their kenaf together to take to Khonkaen; they had hired transport to do so which they estimated to have cost about 0.08 baht per kilogramme carried. In Ban Na Chuak Nuea the group also hired a lorry.

TABLE VII - 6

Kenaf: Place of Sale

Lam Pao Sample Villages 1971-72

VILLAGE	OWN VILLAGE	KALASIN	YANG TALAT	KHONKAEN
	No. Cases			
BAN NA CHUAK NUEA	15	-	-	7
BAN TUM	55	-	1	-
BAN UM MAO	4	2	-	-
BAN FAI TAEK	6	1	-	-
BAN LEK	9	14	-	4
BAN NON SUNG	18	-	1	1
BAN LAO YAI	5	-	1	-
TOTAL	112	17	3	12

The farmers involved in these enterprises tended to be those with larger holdings of kenaf upland. For most farmers, with only two or three rai of kenaf, usually of indifferent quality and with no capital to hire their own transport, local sale with its immediate cash return is preferable. Chaiyong et al. noted in their survey of kenaf growers in six northeatern provinces that

> "About 90% of farmers sell their kenaf to village or amphur buyers." 38

This was in 1966 and the situation had developed rapidly from 1961 when only 73% sold to these merchants. In the Lam Pao sample survey for 1971-72, the situation was not notably different. As Table VII-7 shows, almost all sales were through the three categories of neighbours, village merchants and local merchants from outside the village. Only the 9 cases of sale to Khonkaen and two others unspecified were not at the local level.

The majority of sales were to merchants in the farmer's own village.[39] As with rice trading, these merchants varied in size and most were agents of larger traders at the district level. Some traded only within their own village while others collected supplies from throughout the tambol. Frequently they combined operations in both rice and kenaf, sending both to the same urban middleman. The operation of farmer no. 8 in Ban Tum was typical. He had been trading in both rice and kenaf for about seven years. He said that for both crops he operated only within Ban Tum itself, collecting produce from

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38. Chaiyong et al., op.cit., p.12.

39. Neighbours may be taken as synonymous with village merchants.

TABLE VII - 7

Kenaf - Purchaser

Lam Pao Sample Villages 1971-72

VILLAGE	Neighbour	Village Merchant	External Merchant In Village	External Merchant Elsewhere	Other
BAN NA CHUAK NUEA	2	11	2	6	1
BAN TUM	4	46	4	1	1
BAN UM MAO	1	-	4	-	1
BAN FAI TAEK	2	4	-	1	-
BAN LEK	1	5	3	18	-
BAN NON SUNG	6	11	1	2	-
BAN LAO YAI	-	1	3	1	1
TOTAL	16	78	17	29	4

the villagers and sending it to a large rice mill in Yang Talat where the miller also deals in kenaf. He had no storage space himself, so that when he had accumulated a large enough supply on order, he had the merchant send a truck to the village. The price level was set by the merchant for both crops, but he also charged the villagers 0.10 baht per kilogramme transport cost which he had to pay to the merchant. Overall, this village trader reckoned he had a turnover of 20 tonnes of kenaf and 30 tonnes of rice.

This merchant said that he bought kenaf every year, whatever the price level, but interviews held in other villages suggested that the village trader could be an unreliable outlet as far as kenaf is concerned. One of the merchants in Ban Non Sung mentioned above had also been a kenaf trader. In the 1972 crop season, however, this man had withdrawn from trading, severing his connection as agent for the Kalasin middleman. It was not that the price was very low, but rather that supplies had become rather scarce in Ban Non Sung and the surrounding villages and it was not worth his while to carry on the trade. He confessed that he had done this before in previous years of shortage. Dixon has also commented on the less permanent relationship between traders in the kenaf trade than is the case with rice. This he attributes partly to the lack of financial outlay - in the form of sacks - cementing the trading network.[40]

While for the larger, more distant villages the village merchant is the first link in the marketing chain, for those nearer Kalasin and with small supplies, merchants from outside

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40. Dixon, "Markets, Marketing and Agricultural Change..", op.cit., p.10.

are more important. In the case of Ban Lao Yai and Ban Um Mao, it seems probable that these merchants are only small-scale traders from other villages, but in Ban Lek farmers trade directly with the large Kalasin middlemen. As with the rice trade, these merchants receive supplies both from their agents and direct from farmers and send it on mainly to Khonkaen (80-90%) or to Ban Phai (10-20%) for baling.[41] Of the three merchants interviewed in Kalasin none had baling facilities of his own.

These urban middlemen were less specific about the kenaf trade than they were for rice. It was clear that, as Sholton has noted, they were dependent on the fairness and goodwill of the merchants at the next level.[42] On the other hand, it did seem likely that they were able to make some degree of profit out of their operations over the grading process. Whether buying directly or through their village agents, the district-level middlemen normally purchase the kenaf fibre as mixed-grade. They then carry out their own preliminary grading by opening the farmer's field bale, roughly separating the different grades and then re-baling the fibre by grade. The price paid to the farmer is such that the middleman is unlikely to make any loss whatever the grade composition of the farmer's bale.

It is in this respect that the kenaf trade in the North-east region is least well developed. Although the same organisation which works relatively efficiently for the rice trade operates in the marketing of kenaf, the relative instability of the kenaf market means that the marketing

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41. Figures derived from interviews with middlemen in Kalasin town in 1973.

42. Sholton, op.cit., p.41.

system at the village level is rather less reliable. Even at the district level merchants admit that they tend to buy much less when the prices are low. The major problem is, however, that of grading. Chaiyong et al. noted a price difference in the three major grades of kenaf ranging from 0.4 baht per kilogramme in Nakorn Ratchasima to 0.8 baht per kilogramme in Khonkaen, Mahasarakham and Ubon Ratchatthani.[43] Farmers cannot insist on being paid according to grade content, for they themselves are not aware of the standards by which to judge it. Nor it would appear do all merchants use the same standards.[44] What is clear is that

> "..present marketing institutions do not pass the benefit of grade premiums on to the producer. This is especially true for farmers who have relatively small quantities of marketable surplus." 45

Such farmers are dependent on the village merchants who, while they provide a convenient service for the product, can know little of grading. There is little incentive, therefore, for the small farmer to increase the quality of his produce. On the other hand, as has been noted in Ban Na Chuak Nuea and Ban Lek,

> "..farmers with larger quantities to sell can have direct contact with kenaf balers or wholesale dealers and thus manage to get better prices for higher grades." 46

In this way the present kenaf marketing structure appears to be working both inefficiently and unfairly.

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43. Chaiyong et al., op.cit., p.41.

44. Ibid., p.4.

45. Agarwal, op.cit., pp.21-22.

46. Ibid.

Marketing Systems for Other Crops in the Lam Pao Area

The marketing systems for other crops within the Kalasin area of Northeast Thailand remain at a developmental stage. For the majority, no definite sales channels have been established for the number of farmers cultivating them is relatively small. The few traditional products like kapok are generally traded as a sideline by merchants also involved with rice or kenaf. Recently a number of villages in the area have begun to specialise in the cultivation of particular crops, but these are mainly exchanged with produce from other villages or sold direct to the retail market in Kalasin. Particularly notable in this respect has been the specialisation of a number of villages on the road between Kalasin and Kamalasai in chilli cultivation.

Within the villages studied in the Lam Pao sample survey, the only major specialisation of this sort has been the dry-season cropping of cucumbers and string beans following irrigation in Ban Na Chuak Nuea. The development is still on a relatively small scale with perhaps 20-30 rai in the 1971-72 dry season and about 50 rai in 1972-73 given over to these crops, sweet corn and a little peanuts. Already, however, this diversification of the cropping pattern is illustrating the potential marketing problems which may be expected to accompany the initial expansion of new crops in the area. Already, with production on a relatively small scale in a single village, the farmers of Ban Na Chuak Nuea have been experiencing difficulty in selling their produce. Although individual villagers do take supplies themselves to Kalasin, most have been accustomed to be sold through local merchants.

Originally one of these was the son of the former headman of the village, who ran a small pick-up bus on a regular service between Yang Talat and Amphur Sahatsakhan.[47] He sold the village produce at both these centres as well as in Kalasin, but found that even the urban centre, with its population of 14,960,[48] could not absorb the supplies available. In the dry season of 1971-72 he had already extended his operations to the adjacent district of Kantharawichai in changwat Mahasarakham. Since then the situation has not notably improved, although casual visits by other small merchants have replaced the enterprise of the headman's son.[49]

Although the production of cucumbers in Ban Na Chuak Nuea is highly concentrated into April and May and tends to flood the market only temporarily, it is obvious that the development of a diversified cropping pattern in the Lam Pao project area cannot be based on the single market of Kalasin alone. Crops must be developed which are in demand elsewhere and systems of distribution must be developed which allow these to be profitably exported from the province. At present this all seems to depend very much on the individual enterprise of merchants in the area and without their support widespread diversification is impossible. A major extension effort has led to the expansion of peanut cultivation along the 1L-1R lateral canal since 1972. In the first year of production the peanuts

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47. A new settlement, part of the Lam Pao resettlement area, replacing the drowned township of the same name. It is also known as Phusingh.

48. National Statistical Office, "1970 Population and Housing Census, Kalasin Volume", Bangkok 1973, Table 1, p.1.

49. The writer has been embarrassed by daily presents of large numbers of cucumbers during work in the village!

from an area of about 80 rai, mainly in Ban Dong Muang, had to be sold in Kalasin market for the manufacture of a particular type of Thai sweet. Despite this farmers were encouraged to expand their production in subsequent years. Until the establishment of an oil press in Khonkaen in 1974, the only processing facilities in the Northeast were at Nakorn Ratchasima and visits by merchants were few and prices low. It was only by 1975 that the problem was solved to some degree. Then government agents made arrangements to buy up the greater part of the crop for seed in order to extend peanut cultivation elsewhere in the Northeast. The government guarantees led to a further expansion; before they had been given the low prices they had received had encouraged some to plan a reduction in the planted acreage. Even so the problem is not fully solved and the call by Thieme for more processing facilities seems as valid as previously.[50]

The most successful development of a marketing network in the area in the last five years served to highlight the importance of the external market and the reliance on merchant enterprise. Cassava was introduced into Kalasin some years ago, but only on a small scale. In 1968 there were only 391 rai planted in the whole changwat;[51] by 1970 this had grown to 4,435 rai[52] and by 1972, some 10,615 rai were planted in

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50. Thieme,J.G., "Projects for the Development of the Vegetable Oil Industry", Bangkok 1960, p.4, quoted in Muscat, op.cit., p.196, footnote 65.

51. Department of Agricultural Extension, "Satiti Karn Pluuk Phuet Rai Le Phuet Phak 2511", Bangkok 1971, p.97.

52. Department of Agricultural Extension, "Phaen-Thii Songserm Karn Kaset Phak Tawan-Ork Chiang Nuea", 2515-2519, Bangkok 1972.

the three districts of Muang, Yang Talat and Kamalasai alone.[53] The earliest expansion had been in the resettlement area, where extension activity had encouraged cultivation and where small chipping plants were set up for the initial processing.

From here cassava tubers became available to farmers within the irrigation area. The difficult journey to the chipping and drying facilities in the resettlement would probably have held up its spread, had it not been for the enterprise of a former villager of Ban Na Chuak Tay. This man, at present living in Bangkok, financed the establishment of a chipping plant and drying floor along the access road to the Lam Pao dam site. This establishment soon became the centre for cassava processing for farmers within the Right Bank Stage 1 part of the irrigation area and of the adjacent upland.

Other plants at Yang Talat and on the outskirts of Kalasin itself have been established within the irrigation area since then and one of these has recently added sophistication to the marketing and processing of cassava inside the province. The expansion of the area cultivated has encouraged the merchant in Kalasin to set up a pellet factory in competition with or supplementary to the chipping mills. Established in May 1973 this mill is small compared to those in Khorat province, but the merchant, seeking to take advantage of the price differential between cassava chips and pellets at

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53. Figures supplied by Kalasin Provincial Agricultural Office.

the Bangkok market,[54] was confident of recouping his investment within a few years. To keep the pellet mill running at all times, this merchant's chip production of 1400 tonnes in his one year of operation was quite inadequate and he was, after only a few days operation, seeking supplies from other small chipping mills in the area.

The international demand for cassava in the last two or three years has encouraged this investment and has brought a competitive element into cassava marketing in the province.[55] Chipping plants and pellet mill are competing directly to obtain supplies from the farmers and the bigger plants employ labourers to lift the cassava roots for their customers. A reliable marketing mechanism has grown up in a very short time and farmers have only benefited from its development. Such facilities would also encourage the adoption of new crops on the lowland.

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54. Pellets are more popular on the West European Market because of the lower ash content. But see International Trade Centre, "The Market for Manioc as a Raw Material for the Manufacture of Compound Animal Feedstuffs in the Federal Republic of Germany, the Netherlands and Belgium", Geneva, 1968, p.44.

55. The cassava boom has continued long enough to encourage the foundation on the road between Yang Talat and Kalasin of a cassava flour mill, beginning production in 1975. The cost of the land alone was 700,000 baht. Competition and the sophistication of the market network is further increased by this development.

The Supply of Agricultural Inputs

Like the marketing channels of the non-rice crops, the development of channels of supply for agricultural factor inputs has been only relatively recent and for most supplies must be regarded as embryonic. Until the last decade there has been no real demand for such inputs as fertilisers, pesticides and tractors; nor have these been available at a price sufficiently attractive to give a farmer adequate return on his investment. When agriculture consisted of rice cultivation and the small hand-version of the tractor was undeveloped, draught animals were more efficient in the preparation of the paddy field than the large tractor. Where farmers continued to use the well-tried local varieties of rice seed, with the lack of response to fertiliser application, there was little point in having supplies available. Where a rice crop was basically at risk from the weather, there was little point in investing in pesticides to reduce a relatively minor hazard.

The penetration of commercial agriculture into Northeast Thailand has slowly encouraged the use of such inputs. The development of cash crops, the spread of new rice seeds, the decreasing availability of land resources for increasing production by extension of the cultivated area have all contributed to the growing demand for these factors. The clearance of upland and the relative difficulty in preparation by draught animals has created a demand for tractor supplies. In the last decade, most Northeast farmers have turned to semi-improved varieties of rice, like the glutinous 'niaw Sanpatong' or the non-glutinous 'khaaw dork mali', both of

TABLE VII - 8

Percentage of Households Using Farm Inputs

Lam Pao Sample Villages 1971-2

	Fertilizer	Insecticide	Tractor	Water Pump
BAN NA CHUAK NUEA	67.6	48.7	5.4	13.5
BAN TUM	68.3	18.3	6.7	1.7
BAN UM MAO	90.6	34.4	-	3.1
BAN FAI TAEK	47.8	13.0	-	21.7
BAN LEK	66.7	35.7	26.2	2.4
BAN NON SUNG	91.9	35.1	-	-
BAN LAO YAI	25.0	8.3	-	-
OVERALL	70.4	29.6	7.0	7.0

which do have a certain degree of responsiveness to fertilisers. At the same time, these new varieties and the new upland crops are much less resistant to pests and disease than the long-developed, well-adapted strains.

Yet, despite these developments, the use of such factor inputs in agriculture in Northeast Thailand has not expanded as much as might have been expected. In the Lam Pao irrigation project area, by 1972 70.4% of farmers were using very small amounts of fertilisers, only 29.6% used pesticides and a very small proportion indeed availed themselves of the supply of tractors or water pumps. Table VII-8 shows the proportion of participation in the use of inputs by village and it may be noted that, rather surprisingly, participation is lowest in most of the villages suffering from high pressure of population. Use of fertilisers is highest indeed where rice is grown on a more commercial basis; use of insecticide corresponds equally to this pattern, although the highest rate is for Ban Na Chuak Nuea with its dry season cucumber cultivation. Use of water pumps is interestingly highest where irrigation water has been received.

If these participation rates are examined on the basis of the different crops grown in the area, another interesting picture emerges. (Table VII-9). The low investment in kenaf is easy to interpret; it has been noted earlier that for most farmers there is no feeling of permanent commitment to the crop. Such an attitude to cash inputs corresponds closely to the attitudes to land holding and labour inputs noted earlier. What is less explicable is that only just over half of the farmers in the survey were using fertiliser on the staple glutinous rice crop. Obviously there will be

TABLE VII - 9

Use of Farm Inputs By Crop

Lam Pao Sample Survey 1970-71 & 1971-72

	Fertiliser % Households Using		Insecticide % Households Using	
	1970-71	1971-72	1970-71	1971-72
Glutinous Rice	52.3	58.2	12.2	15.9
Kenaf	2.1	2.0	4.3	4.7

a number of households who find difficulty in raising the necessary capital to purchase fertiliser. On the other hand, more important is the feeling that to spend valuable capital on cash inputs like fertiliser in a situation where a farmer cannot rely on a crop is an unnecessary risk. In the 1970-71 sample survey, one farmer in Ban Um Mao had invested in fertiliser to the extent that when his crop was flooded out he lost money to the tune of 45 baht per rai on the actual value of the crop. Other farmers were in similar positions.

In the present circumstances, it is still not certain that a farmer investing in factor inputs in agriculture will get any real benefit. With regard to fertiliser, the most widespread of the inputs used, to be sure of gaining the maximum advantage a farmer must be sure of using the right kind of fertiliser in sufficient quantity and applying it at the right time. A survey carried out in changwat Roi-et noted that

> "..a great number of shops offer a great number of fertiliser brands and formulae so that a farmer who does not receive previous instruction is left to the grace and advice of the shopkeeper." 56

While most shopkeepers will inform the farmer to the best of their knowledge which type to use, the range can be bewildering. Fertilisers available in Kalasin included NPK formulae 16-20-0, 15-15-15, both for use on rice, 12-12-17 and 12-12-17-2 ('2' of Magnesium Oxide), both for use on dry-foot crops

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56. Stent, James, "Marketing Pattern in a Northeastern Thai Changwat", quoted in F.A.O./U.N.D.P. "Agricultural Credit in Thailand with Special Reference to Fertiliser Use", Bangkok 1971, p.22.

like vegetables, peanuts, water melons, and Urea.[57] Recommendations on the most desirable level of fertiliser application vary too. Sarot and Sombhot have presented the results of experiments carried out in Thailand by the Rice Department which suggest that the return on an input of 15 kilogrammes per rai will give a highly profitable yield increase in the Northeast.[58] These experiments have used the most common fertiliser available in the region, ammonium phosphate of the formula 16-20-0. Watabe similarly quotes experiments undertaken in the Northern region specifically on glutinous rice which yielded increases of between 73 and 92 kilogrammes per rai using some 18 kilogrammes of the same formula.[59] Unfortunately both these assessments have been made of cultivation under experimental conditions and under true farm conditions it is unlikely that such levels of fertiliser input are achieved and that the return is likely to reach similar levels.

On the other hand, data from the Lam Pao sample survey in the 1970-71 crop season showed that for an average input of 9.7 kilogrammes per rai planted, the 124 farmers for whom complete data of fertiliser use was available, seemed to be obtaining a reasonable return. An examination of the relationship between paddy yield and fertiliser input per rai for these farmers gave a correlation of 0.53, significant at the 99.9% confidence level. To assess the nature of this

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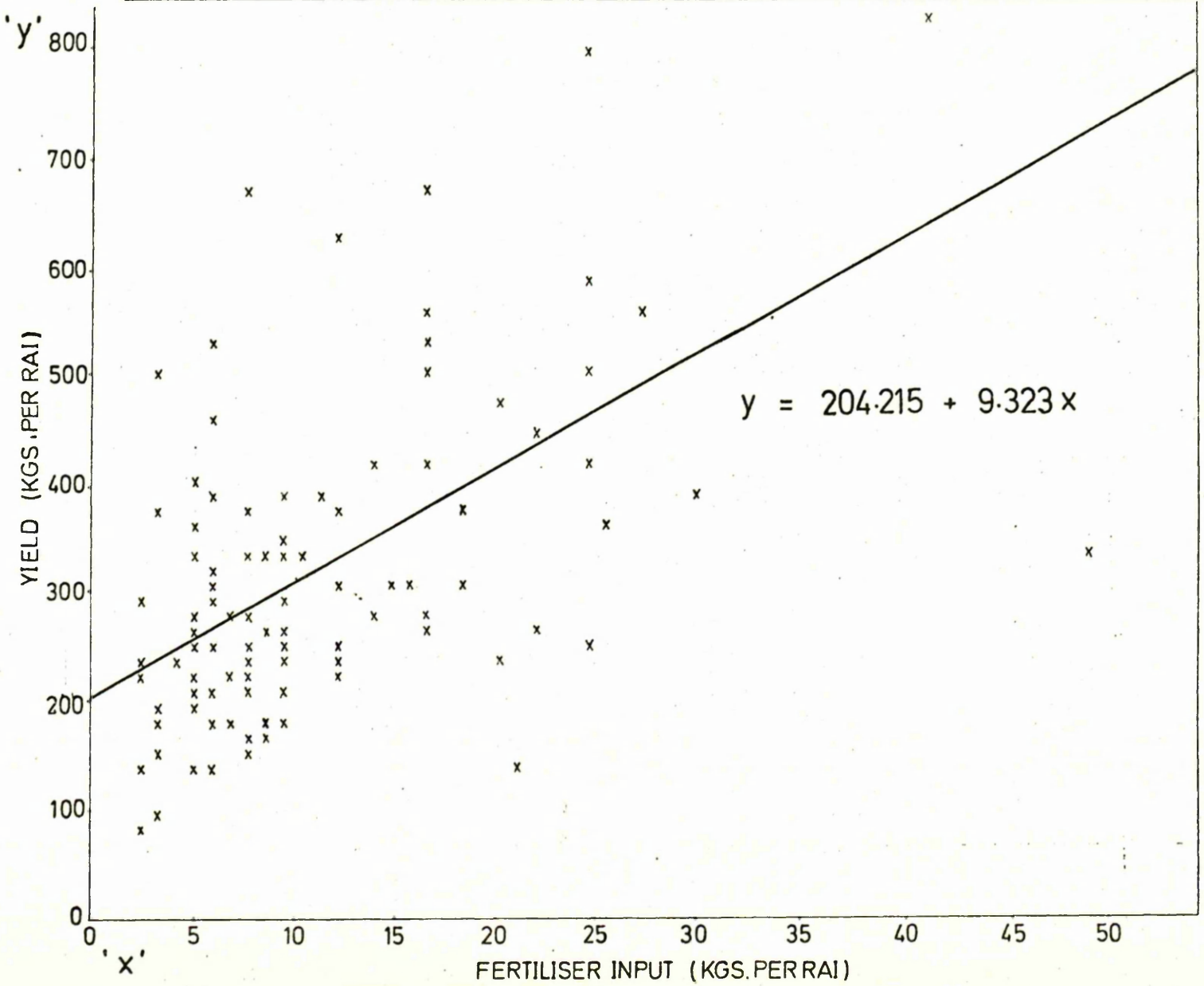
57. There are also various brand names. These included 'Bay May', 'Hua Wua', 'Flying Horse', 'Rising Sun', 'Chaaw Naa' and BASF Nitrophoska.

58. Sarot Montrakun and Sombhot Suwanawong, "Rice Cultivation", Bangkok 1971, p.37.

59. Watabe, Tadayo, "Glutinous Rice in Northern Thailand", Center for Southeast Asian Studies, Kyoto 1967, p.48.

FIGURE VII-4

REGRESSION PLOT OF RICE YIELD ON FERTILISER INPUT PER RAI PLANTED



relationship, a regression analysis was carried out and this revealed the equation:

$$y = 204.215 + 9.323x$$

where 'y' is the yield per rai and 'x' the input per rai of fertiliser. This suggests an average increase in yield for the 124 farmers of some 90.34 kilogrammes per rai, an apparently profitable investment. (Figure VII-4).

It should be noted, however, that inputs of fertiliser only give a partial explanation of the differences in yield per rai on rice and the actual profitability of the investment depends on the relationship between relative price levels for rice and fertiliser. The environmental hazards which affect rice yields and the fact that they may also increase through an increased input of labour work against full commitment to fertilisation. Figure VII-5 shows the relative profitability of fertiliser application on the basis of the above equation as rice and fertiliser prices vary. It is clear that any fall below that rather high return would call into question the investment with the increased price of fertiliser prevalent by 1974-75.[60]

The low level of demand for and the uncertain benefit of agricultural inputs like fertiliser and insecticide makes the establishment of an efficient supply network difficult for the present marketing institutions. The whole problem is caught in a vicious circle. As the USBR puts it:

> "As there are no well-established marketing or distribution systems for input items such as improved seeds, chemical fertiliser

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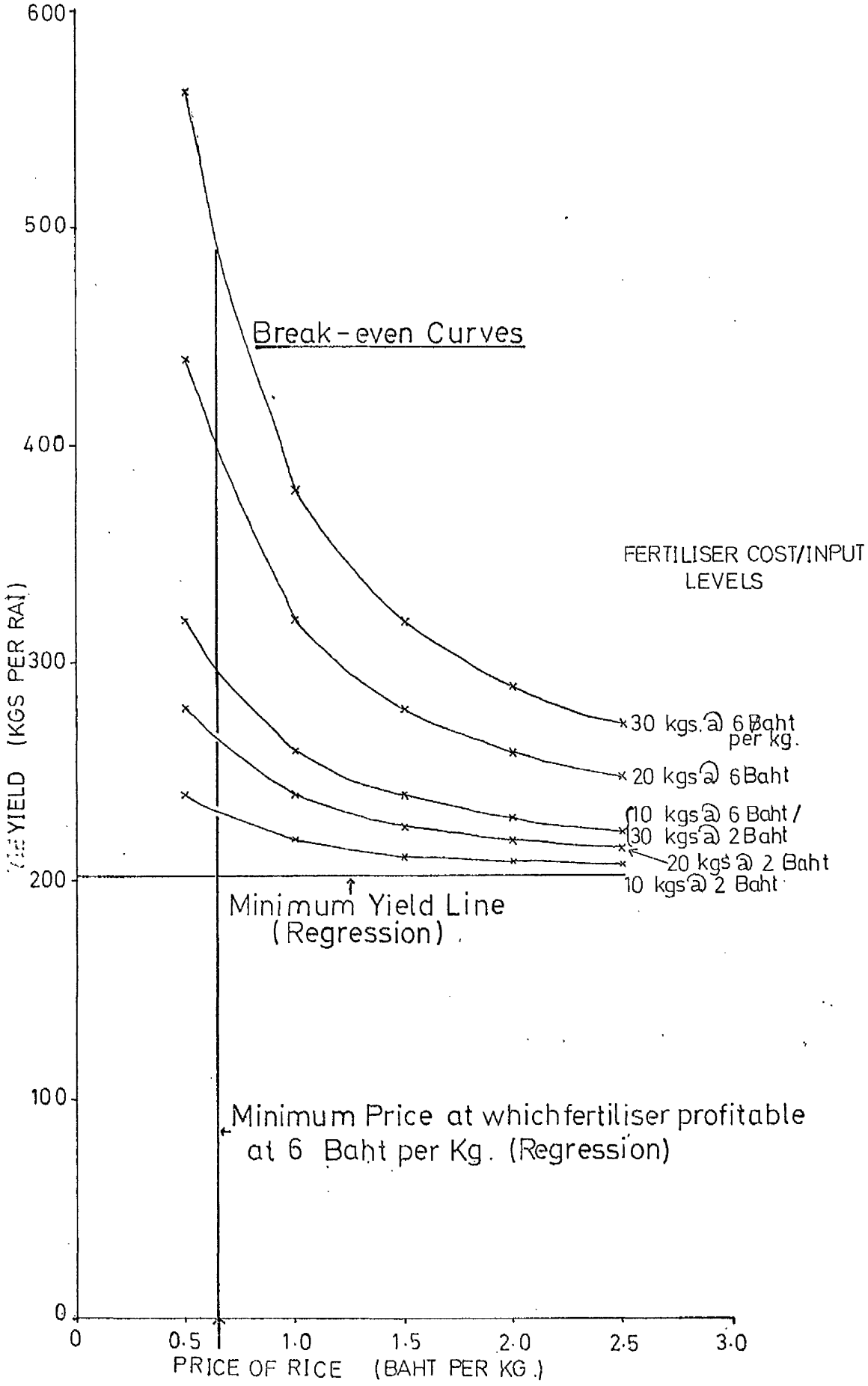
60. With the hike in world oil prices, fertiliser prices in Thailand rose from 2 baht/kg. in 1970 to 6 baht/kg. in 1975.

FIGURE VII-5
RELATION OF FERTILISER COST AND RICE RETURN



> and insecticides, the costs of these items are rather high" 61

High cost supplies make farmers less likely to take the investment risk involved in the purchase of these products, unless crop sale prices are also high. If farmers do not purchase these inputs or are irregular in their purchase, it is even more difficult to establish adequate supply channels.

In Kalasin the low level of development of most supply channels is very clear. Supplies of insecticides are available and retail outlets in the district centres and even in some small village shops, but sprayers by which to apply them are in short supply, even in the town. For these and water pumps the retailers maintained limited stocks and orders have to be placed by interested customers with the possibility of a long waiting period. Even the pesticide sprayers supplied by the local agricultural offices have the problem of lack of repair facilities.[62] New, improved seeds have also been scarce, both from the government services and on the open market, where farmers cannot be sure of their quality. One farmer in Ban Na Chuak Nuea had had what is apparently a common experience. Obtaining in 1972 supplies of seed of the new, fast-maturing upland jute which had been introduced into the area by the provincial agricultural office, he had

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61. United States Bureau of Reclamation, "Pa Mong Stage 1 Feasibility Report, Appendix 6, Economic, Agricultural, Social and Financial Analysis", Bangkok 1970, p.III-67.

62. A problem made apparent to the writer when he spent several days trying to obtain a leather washer of the right calibre for the pump mechanism of an insecticide sprayer given by the extension officers to the headman of Ban Dong Muang for use on his peanuts. Khonkaen was the nearest source!

sown this only to find that it failed completely to germinate. He had sought the seed supplies from the district office in Yang Talat, but none were available and he had eventually purchased it for 100 baht in Kalasin market. This had been bad and the farmer was reacting accordingly; his future plans involved not kenaf but cassava.

Access to tractors in Kalasin has been improving. In 1971, tractors were rarely used in the irrigation area and even in the resettlement, where clearance of forest for cultivation of cassava had started on an extensive scale, farmers reported the need to hire from firms based in Khonkaen, Khorat and even Saraburi. Since then demand has increased as farmers have seen the advantage of early ploughing and early sale of kenaf in particular and by 1973 Kalasin itself had a tractor hire firm. Generally, however, prices remain high, with a standard rate of 50 baht per rai in 1973. In Ban Lek lower rates of 35 baht per rai have been charged on the ground that one of the tractor operators is a native of the village. It may be supposed that the higher prices available for both cassava and kenaf after 1972 had made tractor ploughing more worthwhile and able to be absorbed by the higher returns. One can only speculate on the result of a fall in the price level of these two crops.[63]

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63. By 1974-75 the cost of tractor ploughing had risen to 75-90 baht per rai. That this increase was not as large as the rise in oil prices probably reflects the greater competition in the area with greater demand as crop prices have stayed high.

The Supply of Fertilisers in Lam Pao

Even the relatively high proportion of farmers using fertilisers in the Lam Pao area has not yet stimulated the creation of a stable and efficient system of supply at the farm level. Fertiliser prices currently being charged to farmers are highly variable and the chain of supply is long and complicated. The steady increase in fertiliser prices has made the situation even more complex. Even before the oil price rise mentioned above, companies had sought to increase prices by reducing the size of the sack. Instead of the standard 50 kilogramme sack, by 1972 sacks of 40 kilogrammes and 75 lbs. were to be found. Only after that date did the price per bag increase, although the price per kilogramme had been rising slowly for some time.

Farmers can obtain their fertiliser supplies from a variety of sources. Apart from the co-operatives and other government agencies whose activities will be considered in the next chapter, there are two major retail sources. If ease of transport allows, the farmer may buy in the market at Kalasin or even Yang Talat. Others, usually having little business outside the village and living far from the town, prefer to purchase their supplies in their own village from resident or itinerant merchants. These agents are usually agents of larger middlemen based in Kalasin.

Table VII-10 sets out the sources of fertiliser supply to farmers in the seven villages of the Lam Pao sample survey in 1972-73, when supplementary enquiries were made on this theme. Typical channels compared very closely to those observed in examining the market structure for rice

TABLE VII - 10

Source of Fertilizer Supply

Lam Pao Sample Villages 1972-73

Village	Co-operative	Kalasin Market	Kalasin Merchant	Yang Talat Merchant	Village Merchant	Outside Merchant In Village	Total
				No. Cases			
BAN NA CHUAK NUEA	4	-	-	-	7	2	13
BAN TUM	7	6	4	1	11	1	30
BAN UM MAO	7	12	3	-	2	2	26
BAN PAI TAEK	1	4	2	-	-	1	8
BAN LEK	1	20	6	-	1	3	31
BAN NON SUNG*	-	1	3	6	19	1	31
BAN LAO YAI	-	1	-	-	-	1	2
	20	44	18	7	40	11	141
Average Price (Baht/Kg)	1.88	2.19	2.17	2.08	2.57	2.25	

* 1 Case of Purchase from Roi-et

Source: Supplementary Survey 1972-3

and kenaf; indeed, it is not unusual for the fertiliser supply merchant to be also concerned with the purchase of these two crops. Ban Um Mao, Ban Fai Taek and Ban Lek, all close to Kalasin town, seek their fertiliser from Kalasin market or large merchants in and around the town. Ban Tum and Ban Non Sung support village merchants to a large degree, but Ban Tum has also been penetrated by co-operative activity. Ban Na Chuak Nuea is dominated by sales from the co-operative and from village merchants, but this latter group includes the then headman who is a co-operative official and resells co-operative supplies and the village shop which sells small bags of fertiliser for cucumber cultivation.

It might be expected that the different sources of supply might show interesting variations in price levels according to the length of chain of supply. Shops in Kalasin market and co-operative organisations should be able to charge a cheaper rate than small-scale merchants in the village. The latter are the end of a longer supply chain and have to charge transportation costs for the transfer to the village. The market shops have connections with Bangkok or Khonkaen wholesalers and can order supplies as and when they want them; farmers who are co-operative members order their requirements in advance and as a consequence the co-operative can assess exactly its requirements and make bulk purchases.

These price differences do not emerge, however, from a consideration of the average prices charged by the various channels of supply. Table VII-10 includes the average price recorded for each source of supply. If one considers the total sample of farmers interviewed, only those buying

from the co-operatives have a notably lower average price per kilogramme on cash sales. However, it does appear that all the average price levels recorded are rather low. The Thai government semi-subsidised price for fertiliser was then 2.0 baht per kilogramme;[64] it is unlikely that any sources actually sell below this price. It would appear that many farmers in the sample were estimating price by the bag and were assuming the old 50 kilogramme weight per bag, giving an overall underestimation of the price per kilogramme. An examination of selected farmers who proved rather more reliable on the grounds that they were aware of the brand of fertiliser they had purchased, had the correct weight and were even able to suggest differences between cash and credit prices, does indicate that village merchant prices may be higher, but the small sample size makes it unwise to draw definite conclusions. Some farmers were, moreover, including their own transport costs in their calculation of their market purchase price, while there is evidence to suggest that middlemen buying in bulk also got lower prices than ordinary farmer buyers from the urban wholesalers. Both these considerations serve only to blur the picture.

It is true that supplies delivered by village merchants pass through more intermediaries than those purchased at the market and that each person in the supply chain receives some reward for his services. In 1973 investigations into the extent of this reward were carried out in the Lam Pao survey villages, particularly in Ban Non Sung.

In this village the chief fertiliser merchant was the same farmer who was described earlier trading in rice and kenaf.

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64. Sarot and Sombhot, op.cit., p.37.

In 1972-73 crop season he had sold about 200 bags of fertiliser, consisting of 70 bags of 'Hua Wua' (Cow's Head) brand in 75 lb. bags and 130 bags of 'Chaaw Naa' (Farmer) brand, each containing 40 kilogrammes. When villagers wanted supplies he would order these from the Kalasin merchant to whom he sold his rice and kenaf; he maintained, as the middleman himself later confirmed, that this establishment received its supplies from a wholesale-cum-retail grocery store in Kalasin market; the grocery store in turn obtained the fertiliser direct from Bangkok. At each stage there was a small mark-up in price.

As of July 1972 the cash price in Kalasin market for the 75lb. bags of 'Hua Wua' was 67 baht. The village merchant said he was selling in the village for 70 baht per bag (cash), giving him a profit margin of 5%. He said that 67 baht was the price charged to individual farmers; he gathered that the middleman, buying in bulk, received some reduction on that figure.

The margins obtained by the middleman and the Kalasin wholesale shop could not be obtained by direct enquiry, but the figures presented by Stent for Roi-et may be taken to be fairly representative. He noted that a wholesaler in changwat Roi-et bought fertiliser from Bangkok at 73 baht per bag; he then sold for cash to a retailer in Amphur Pathum Rat for 75 baht; the Pathum Rat retailer, however, had a much higher profit margin, selling to the farmers on a cash basis for as much as 95 baht.[65]

The above discussion has been concerned mainly with cash price, but it is apparent that much of the sale of

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65. Stent, op.cit., in F.A.O./U.N.D.P., op.cit., p.31.

TABLE VII - 11

Fertilizer: Cash & Credit Prices by Source

Lam Pao Survey 1972-73

Source	All Farmers			Selected Farmers		
	Cash	Credit	Ratio	Cash	Credit	Ratio
	(Baht/Kg)			(Baht/Kg)		
Kalasin Market	1.97	2.44	1.24	2.00	2.55	1.27
Village Merchant	1.96	2.29	1.17	2.24	2.63	1.17
Kalasin Merchant	1.99	2.39	1.20	1.91	2.34	1.23
Co-operative	1.83	1.95	1.07	-	-	-

Source: Supplementary Survey 1972-73

fertiliser which takes place in Kalasin is on credit terms. In the price of the co-operative organisations this makes no difference to the price charged, but for other sources of supply it means that prices to the farmer increase substantially. On the other hand the difference between the respective cash and credit rates of the various sources of supply is only marginal. As was noted above, in 1973, farmers were asked not only about the source of their fertiliser and the cost, but also whether they had purchased on cash or credit terms. Some farmers buying on credit were able to give the cash rate prevalent at the time of purchase. Table VII-11 presents the difference between the average cash and credit prices for the total sample and for the selected group of farmers according to source.

The premium placed on cash purchase is confirmed if we again examine the activities of the village merchants in Ban Non Sung. It was noted above that the village trader makes three baht profit on a cash transaction on one brand of fertiliser. The other brand he did not sell for cash, but only on credit. The difference in cash and credit prices for the two brands is shown in Table VII-12. Again there is a very substantial increase in the price of credit purchase, with 'Chaaw Naa' brand showing rises of between 25% and 37.5% and 'Hua Wua' brand between 19% and 42%. It is interesting to note that the differential made by this merchant is designed to encourage the other part of his business by favouring those farmers who sell rice to him.

Overall the picture of the fertiliser supply trade in the Kalasin area leads to one important conclusion, namely that the whole system tends to favour the better-off farmers.

TABLE VII - 12

Fertilizer Brands: Price by Source
Kalasin Market and Ban Non Sung
1972-73

Source	BRAND "Hua Wua" (33 kgs) Price Per Bag (Baht)	BRAND "Chaaw Naa" (40 kgs) Price Per Bag (Baht)
Cash at Market	67	80
Cash in Village	70	No Sale
Credit to Rice Sellers	80	100
Credit to Others	95	110

Source: Ban Non Sung Interviews 1972-73

The richer farmers are more likely to be able to get to the markets at Kalasin, Yang Talat or even Roi-et where they can buy at possibly the cheapest cash rates. Richer farmers, as sellers of rice, are more likely to be able to take advantage of the reduced price by selling to the merchant supplying the fertiliser. Richer farmers are more likely to have the cash immediately available in July and August when the bulk of the fertiliser is applied. By this time, some 7-8 months after the paddy harvest and perhaps as much as ten months after the kenaf is cut and sold, many farmers' stock of ready cash will be running low and purchase on credit may be necessary.[66]

The premium on cash purchase is such, however, that farmers are attempting to pay cash at this time, putting their livelihood in jeopardy. The case of the elderly female head of household in Ban Non Sung has already been mentioned above. In such cases farmers have to make an assessment of whether it is more expensive to pay for fertiliser on credit or to gather cash from the sale of assets or from borrowing. If this can be done without incurring interest as was the case with the woman in question, then the decision will probably be in favour of cash purchase. If interest is charged or, as above, rice might have to be purchased at a later date, then the decision is more problematic. In essence farmers buying on credit in July and paying after harvest in January or February are paying interest of 5-6% per month,[67] a common rate

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66. See above, Chapter VI.

67. Stent in FAO/UNDP, op.cit., p.31 records an increased charge of 35 baht on credit sale with repayment after eight months. The respective rates are then 95 baht per bag cash and 130 baht on credit - a 37% increase.

for money borrowed from non-institutional sources. If during that period the price of rice increases, as was the case in 1972, a farmer who has bought his fertiliser with rice needed for consumption will also effectively be paying interest. In 1972 the selling price of paddy at the village level was about 1.0 baht per kilogramme in July; by February 1973 it had risen to 1.3 baht. Thus a farmer selling 100 kilogrammes to pay for fertiliser would be faced with an interest rate of about 4% per month when he sought to re-purchase rice.[68]

The interest charged by the fertiliser merchants, whether they be urban middlemen or village agents, is similar to the rates charged on cash loans described earlier because the risk they are taking is essentially similar. They must guard against default on payment in conditions where farmers have no control over the environmental hazards. They are providing short-term credit with capital which could more profitably be invested elsewhere. As it is they provide an important service to the farmer, more important indeed than the straightforward moneylender, for credit on fertiliser ensures its productive investment.

Although these traders are offering an essential service, it would appear, however, that the whole system of fertiliser supply in the commercial sector does not work equitably. There is a considerable advantage to those who have the ready capital for cash purchase and for the already commercially oriented. At present a less well-favoured

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68. This assumes a farmer can buy his rice in the village. If he has to buy in the market then the price is much higher. The equivalent market rate in early 1973 was 2.5-3.0 baht per kilogramme.

> "... farmer who really wants to increase his productivity by using fertiliser probably finds it unprofitable to do so unless more favourable credit facilities can....(be provided). 69

USBR consider that as farmer commitment to fertilisers increases, the supply channels will become more efficient and prices will fall[70] and it is likely that irrigation water will encourage greater commitment by removing some of the environmental constraints, but this must be set against the continued rise in fertiliser prices due to world market conditions. Moreover, as Figure VII-5 has illustrated, the profitability of the investment depends very much on the prices of the various farm products at a particular time. Nevertheless, it does seem to be the case that with more reliable supply of the correct formulae of fertiliser and the improvement of credit purchase, the input channels in the Northeast of Thailand can be improved, not only for fertiliser, but for the other inputs which might assist agricultural diversification and development. Already the farmers' associations are providing fertiliser at rates cheaper than the other sources; perhaps it would be an advantage if they were to extend their influence.

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69. FAO/UNDP, op.cit., p.23.

70. United States Bureau of Reclamation, op.cit., p.III-67.

CHAPTER VIII

THE ROLE OF GOVERNMENT INSTITUTIONS IN THE RE-ORGANISATION OF FARM RESOURCES

The arguments followed in the previous chapters have sought to demonstrate that the arrival of irrigation in an area where agriculture has previously been closely adapted to difficult environmental conditions will call for an extensive re-organisation of resources at the farm level. The traditional considerations which influenced the organisation of land and labour resources in the Northeast region of Thailand will be outdated by the demands of the new irrigation system. Farmers' valuation of their land will change and a premium will be put on that land most favoured by the new facilities. The regulation of farm activities imposed by the discipline of water management will disrupt the traditional forms of labour organisation and increase the need, especially in the dry season, for more flexible arrangements of labour resource utilisation. This tendency, the desire for land improvement and development inside the irrigation area and the necessity for application of new factor inputs will all increase the demand for capital resources in agriculture when hitherto these have been in short supply. At the same time, new cropping developments will call for an improvement in the efficiency of present channels of input supply and marketing and the creation of adequate outlets for new crops.

Without careful attention to the problems thus outlined, the new facilities seem likely to favour the larger, richer farmers more than the mass of semi-subsistent cultivators.

Farmers with existing large holdings in the irrigated areas will immediately be favoured and those with capital to buy land inside the project area will also be at an advantage. With irrigated land in short supply and population pressure increasing, small farmers may well be forced into disadvantageous renting agreements. Wealthy farmers are more likely to be able to take on more labour to assist the production activities than the small farmer with his lack of immediate capital. Not only will the better-off be more easily able to afford adequate levels of input of fertilisers and insecticides, but under the present distribution system, they will be able to receive their supplies at the much cheaper cash price. They are, moreover, more likely to be able to secure better prices for the products by cutting out links in the marketing chain or taking the goods further afield for sale.

It is not proposed that the growth in prosperity of small numbers of wealthy farmers is necessarily an undesirable feature; indeed, such farmers could perhaps have a useful extension effect. On the other hand, if their development is at the expense of or at a much faster rate than the mass of small farmers, it is possible that there will be a development of social and economic problems in the countryside. In the absence of other sources of capital, such farmers could become the financiers for the other farmers who could lose their independence from them. Such developments have occurred elsewhere with the onset of commercial agriculture.

To guard against possible developments of this nature, the Thai government has sought to create conditions which allow all farmers to take full advantage of the potential

benefits of the irrigation system. They have realised that facilities must be offered to allow all farmers cheap and easy access to supplies of credit and other inputs needed to develop their land resources and that farmers must be able to market their increased production easily and at the best price possible. Without these facilities the supply of irrigation water will have no effect. On the other hand, unlike the farmers of the Northern region of Thailand, those of the Northeast have no tradition of irrigated agriculture. Efforts have to be made to explain the functioning of the irrigation system and the need for careful regulation and maintenance; a knowledge of the different water and technical requirements of new crops is equally necessary if the farmers are to receive the full benefits of irrigation; an understanding of the need to contribute to farm ditch maintenance and the necessity for occasional land transfers is also useful.

Although it is quite possible that farmers will adopt new practices willingly and without outside assistance, with irrigation some explanation and regulation is required. The farmer has got to accept that he is a part of a large system and malpractice on the part of the individual can disturb the whole. In this case some extension activity is necessary. Moreover, where the necessary facilities for general agricultural development do not exist and are not likely to be developed within a short time, it is the responsibility of the government extension services to remedy these deficiencies. Certain deficiencies in the supply of agricultural inputs and of cheap credit, as well as in marketing, have been pointed out above. The amelioration of such failings could well require government extension activity.

The Thai government has recognised the need to help the small farmers, not only in the Northeast, but equally in the country's other regions. Research activity has been undertaken to develop new strains of seed, to discover the best levels and frequency of application of chemical fertilisers and to find out the best methods of cultivation for a whole variety of crops under irrigated conditions.[1] The results of this experimental work are complemented by the institution of a large-scale training programme for extension officers whose job it is to get information on the new developments across to farmers. Unfortunately this programme has not yet been able to reduce the severe shortage of officers up-country. Each changwat has its agricultural office, staffed with officers from the Agricultural Extension Department of the Ministry of Agriculture. Through these offices comes the information, the new seeds and the other materials to be distributed throughout the province.

In practice, the real task of getting these materials through to the farmers is done by the staff at the next level, the District Agricultural Office. Unfortunately this district level often tends to be most badly understaffed with only one or two officers for the whole area. In the three districts of Kalasin covered by the Lam Pao irrigation area, for example, there are just two officers to reach the 13,627 farm families in Muang district, the same number for 15,521 farm families in Yang Talat district and only one man for

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1. The work of the Huay Sithon Experimental and Demonstration Farm has been important in this respect.

10,403 agricultural households in Kamalasai.[2] As the supplies available for extension and demonstration purposes are only small, effort tends to be concentrated on a few selected farmers within widely scattered villages. The district offices cannot give farmers any financial assistance so that after the initial demonstration, their effort is often wasted. In most provinces, and this is the case in Kalasin, the district level agricultural officers are supplemented by the staff of the Land Development Department. In Kalasin, their work is centred on an experimental station on the road between Kalasin and Yang Talat. From here a staff of three or four officers concentrate mainly on the extension of dry-foot crops. Even with the addition of these officers, there is a ratio of one officer to approximately 3950 farm households in the three central districts of Kalasin province.[3]

The lack of an adequate extension staff means that, in practice, it is the farmer groups organised by the district agricultural offices under the auspices of the Department of Agricultural Extension which have received most of the attention and the assistance of the extension officials. Indeed it is through farmers' associations in general that most of the extension work is carried out throughout the country. The farmers' associations or co-operative organisations can provide credit facilities, supplies of input materials, advice and in some cases marketing outlets to farmers affiliated to them. Unfortunately, they too have been criticised for their lack of effectiveness in the extension

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2. National Statistical Office, "1970 Population and HOusing Census", Kalasin Volume, Bangkok 1973, Table 1, p.1.

3. By early 1975 some steps had been taken to remedy the deficiency of insufficient extension officers in Kalasin changwat, at least in the area being served by the Lam Pao /contd.

and development process. It is with these farmers' associations that the remainder of this chapter is concerned, seeking to assess their ability to assist in overcoming those problems of agricultural re-organisation under irrigation which were discussed above.

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3. (cont'd) irrigation project. Four new extension officers were appointed for the irrigation area, each of whom were made responsible for four local farmer leaders. It was to be through these latter that the bulk of extension activity at the farm level was to be channelled. They were selected after consultation with village headmen and extension agents in the area and after interview at the Experimental and Demonstration Farm at Huay Sithon. One farmer was chosen to cover every two or three villages then receiving irrigation water, or roughly 200-300 farm families. These farm households were then divided into eight groups of 20-30 families, from each of which the local farm leader was expected to choose four or five farmers as 'contacts' who might be expected to follow his advice.

The local farmer leaders were subjected to an intensive period of training of about 10-14 days at the Huay Sithon farm, explaining to them their duties and acquainting them, by lecture or by practical demonstration, with the latest improved cultivatinn practices, the best methods of fertiliser application and the way to recognise and take precautions against plant disease. As the initial training period was in April 1975, attention was chiefly focused on rice cultivation in preparation for the coming wet season, but training on other topics was expected to continue throughout the year at weekly meetings at the farm.

The local farmer leaders were expected to spend four days of each week visiting each of their eight groups for one half-day each. On such visits they would be expected to pass on the knowledge they had gained from the training sessions. One day each week he would be accompanied by an extension agent. In addition the local farmer leader would be required to pass on any information concerning extension services or water schedules made available by the authorities. The latter, in order to achieve some measure of co-ordination in the organisation of extension services had at the same time established a so-called 'Public Agricultural Committee'. This consisted of the Provincial Governor, the Provincial Agricultural Officer, a representative of the Bank for Agriculture and Agricultural Co-operatives, farmer leaders, such as local 'kamnans', members of the Department of Agricultural Extension, an Israeli consultant working for an I.B.R.D. financed project for rehabilitation of the irrigation project and the head of the Lam Pao irrigation project. Monthly meetings were designed to enable these various agencies to keep in touch with one another's programmes and to arrange their own accordingly.

The Development of Farmers' Associations in Thailand

The first farmers' association to be founded in Thailand was a credit society established in changwat Phitsanulok in 1916. Since that time there has been a steady expansion of co-operative activity in the country involving a number of ministries and many separate departments within those ministries. In 1920, a Department of Co-operatives was set up within the Ministry of Agriculture and by 1952 this had grown to such an extent that it became a separate Ministry of Co-operatives. This then brought together the many small credit co-operatives which had been established and the specialised institutions of the Land Department, which had begun to organise farmers' associations in 1935.

These latter were set up in recognition of growing land problems in the Central Plain where the depression had created a class of landless farmers, farmers with insufficient land to feed their families and farmers forced to use land of inferior quality and with poor water control. In these cases, the Thai government sought to buy up areas of land or to develop new land for settlement and then to establish farmers' associations through which they helped the members buy the available land from the government. Where land could not be purchased or developed anew, the government sought to set up Land Tenant Co-operatives with the purpose of giving farmer members security of tenure. Most of these organisations were founded in the Central Plain to solve problems in specific areas. In the Northeast such tenancy problems did not exist, but there was rather a need for farmers to improve the quality of their land through irrigation and other inputs.

Thus here many so-called 'Land Improvement Co-operatives' were developed in association with the small tank irrigation projects in the 1950s and 1960s. Table VIII-1 shows the state of the Land Co-operative movement in Thailand by 1968.

Among the services of the Land Co-operatives has been the provision of cheap credit to their members and in general this has been the chief function of most of the Thai farmers' associations. By 1967, there existed throughout the country some 9752 village credit co-operatives with a total membership of 156,000 farmers.[4] There seemed to have been no increase in the number of co-operative societies since the late 1950s.[5] Originally these societies were organised very much as the Land Co-operatives to remedy specific problems arising out of the trade depression in the commercialised Central Plain. The major function was to provide long-term loans for the redemption of debts owed to moneylenders or other individuals, as Hughes puts it

> "..substituting low co-op interest for high commercial interest." 6

In recent years these societies have started to provide short-term and medium-term loans ostensibly for production purposes, but still

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4. Singh,Mohinder, "Co-operatives in Asia", New York 1967, p.468.

5. Ward,G.H., "Appraisal of Farmer Co-operatives in Thailand", Bangkok 1966, p.3.

6. Hughes,R.B., "Thailand Agricultural Co-operatives: An Evaluation with Recommendations for Improvement", Milwaukee 1968, p.29.

TABLE VIII - 1

Land Co-operatives in Thailand

1968

	No.Co-ops	No. Families	Area Involved
Land Hire Purchase Co-op	54	947	42,922
Tenant Co-operative*	20	337	13,602
Land Settlement Co-op+	289	5847	154,877
Land Development Co-op	161	82,327	808,670

* Changwats Pathum Thani, Nakhon Nayok, Prachinburi, Kamphaengphet and Phattalung only

\+ Includes salt producers and fishermens co-operatives

Source: Adul Niyomviphat "Land Co-operatives" Thailand Development Report Vo. IV, No. 3, December 1968.

> "..refinancing of old debts has been the most important loan purpose over the years." 7

The supply of credit for the loan activities of the Thai farmers' associations has been provided through the establishment of a government bank specifically for that purpose. This was founded in 1943 as the Bank of Co-operatives, before which time the organisations were financed directly out of their respective ministerial budgets. In 1966, this bank was re-organised by an act of parliament into the Bank for Agriculture and Agricultural Co-operatives which, although it prefers to operate through co-operative organisations, is also responsible for lending directly to farmers who are not members of co-operatives.[8] It may be noted that two provinces in the north of Thailand, Chiangmai and Uttaradit, have long-established co-operative federations which are only partly financed by the Bank for Agriculture and Agricultural Co-operatives (B.A.A.C.); these date from the period before the foundation of the Bank and have financed their members through share-capital, reserves, deposits and borrowing.[9]

The activities of the credit co-operatives in Thailand have come in for a good deal of criticism. According to Ward

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7. United States Operations Mission (Thailand), "Preliminary Report of the USOM Consultant Team on Agricultural Credit; Co-operative Organisation, Management and Administration; and Agricultural Marketing", Bangkok 1959, p.13. But note also the comment that "it should be emphasised that the redemption of former non-institutional loans is necessary before productive use can be made of co-op credit." (Food and Agriculture Organisation, "Agricultural Credit through Co-operatives and Other Institutions", Rome 1965, p.53.)

8. Thailand Development Report, "Agricultural Credit and Co-operatives in Thailand", vol.IV(2), November 1965, p.9.

9. Singh, op.cit., p.467.

> "They have not accomplished their designed purpose of enabling small farmers to re-finance their heavy debts...and to finance greater farm production." 10

While the first part of this criticism would seem to be rather unfair in that most of the case for re-financing of debts has subsided, the second part does seem to be more valid and indeed measures have been taken to re-align policy towards this objective. As was noted above, in recent years policy has been for the small credit co-operatives to make more short-term and intermediate-term loans. Moreover it is required that these loans should be used for financing production expenses, so increasing the likelihood of repayment which has always been at a low level in societies which have incorporated a strong welfare component in their policy. Ward draws attention to the 250 million baht owed by members of the village credit societies in 1965 and compares this with the record of almost 100% repayment over a period of six years by the newly established Production Credit Co-operatives.[11] These are larger organisations in which the supply of credit is linked with the development of a farm plan for the individual borrower and for this reason the activities of the co-operative have also been extended to include supply of inputs and marketing of farmers' produce.[12]

The success of such organisations has encouraged the Thai government into a further re-organisation of co-operatives. In 1970, the village credit co-operatives were linked together

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10. Ward, op.cit., p.5.

11. Ibid., p.3.

12. Radom Seethithorn, "Raay Ngarn Phon Karn Wichay Rueang Karn Damnern Ngarn Khong Sahakorn Pak Chong Camkat Sinchay" (Presentation of the Results of Research About the Progress of the Pak Chong Supply Co-operative), Bangkok 1963.

into large societies at the district level, although they maintained their village organisation. Following the coup of November 1971,[13] a re-organisation of the central government has brought the Agricultural Credit Co-operatives and the Land Co-operatives together into a new Department of Co-operative Extension and plans were going ahead to join the two organisations at the district and provincial level.[14] In irrigation project areas, moreover, there is to be co-operation between the Land Co-operative organisations and the Water Users Associations of the Royal Irrigation Department to co-ordinate extension work with the provision of irrigation water.[15]

These developments are considered to be improvements in the organisation of co-operatives in Thailand. Some have already been put into operation. The amalgamation of the Agricultural Co-operatives and the Land Co-operatives is in preparation at the provincial level. Whether such re-organisations will in fact achieve anything more than the previous structure, however, rather depends on the work of

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13. In November 1971, the ruling group of Thai generals staged a bloodless coup against their own rule with the purpose of closing the assembly and reducing opposition to the rise to power of one of their number, General Prapass Charusathien.

14. Even by 1975, the final amalgamation of the Land Co-operative and the Agricultural Credit Co-operative had not taken place. The whole organisation was called the Agricultural Co-operative and the services provided by it were common, but the administration had still to be amalgamated.

15. Royal Irrigation Department, "Project covering Request for Aid from USOM for the establishment of Irrigation Associations in the Northeast Region for 1971-72", Bangkok 1971, pp.7-8. The writer was present in 1971 at a meeting where co-operation between the Water Users' Associations and the Land Co-operative was being discussed. It is interesting to note, however, that the formal institution of the Public Agricultural Committee in early 1975 to improve co-ordination of the extension services in the irrigation area failed to include a representative of the Land Co-operative.

the organisations at the village level. It appears that under the new systems little of the district level activity of the existing organisations has been or will be changed. Their success will continue to depend on their activity at the farm level. It is this farm-level activity of the co-operative organisations at work in Kalasin province which will now be examined in the context of the problems of resources development foreseen in the Lam Pao irrigation project area.

The Work of Farmers' Associations in Kalasin Province

It will already be clear from the above discussion that there is, at present, little justification for talking about a single Thai co-operative movement; despite the recent plans for amalgamation, the structure of farmers' associations in Thailand remains fissiparous. A whole series of groups still exist, set up by ministries and departments within ministries without reference to each other. Thus there is a widespread duplication and repetition of function wherever any of the various ministries have set up extension services. In addition, the government has set out, since 1966, to encourage commercial banks to help farmers through the establishment of farmer groups in the provinces.

In these circumstances it is scarcely surprising that observations in Kalasin province often revealed that farmers were unaware of which of the many different organisations they were a member. Table VIII-2 presents a summary of the various associations at work in Kalasin province up to the dry season of 1972-73. Although the function of the Water Users' Association is relatively distinct in the absence of People's

TABLE VIII -2

Farmers Associations in Kalasin Province

- as of 1972

Name of Co-operative	Department and Ministry
Agricultural Credit Cooperative	to 1972 Dept, of Credit & Marketing Co-operatives. Ministry of National Development post 1972 Dept of Co-operative Extension, Ministry of Agriculture and Co-operatives.
Land Co-operative	- 1972. Dept of Land Co-operatives. Ministry of National Development. Post 1972 Dept. of Co-operative Extension, Ministry of Agriculture and Co-operatives.
(Rice) Farmers' Groups) Agricultural Clubs)	- 1966, Dept of Rice, Ministry of Agriculture 1966-72 Dept. of Agricultural Extension, Ministry of Agriculture (and Co-operatives 1972).
Farmers' Groups	Bank for Agriculture and Agricultural Co-operatives, Office of the Prime Minister.
Joint Liability Groups	Thai Farmers Bank
Water Users Association	Royal Irrigation Department (-1972) Ministry of National Development (1972 onwards) Ministry of Agriculture and Co-operatives,

Irrigation Associations in the area,[16] the functions of the other groups overlap extensively. Thus the Agricultural Credit Co-operative (A.C.C.), the Land Co-operative, the 'Farmers' Groups' of the Bank for Agriculture and Agricultural Co-operatives (B.A.A.C.) and the Thai Farmers' Bank joint liability groups were all actively providing funds for farmer borrowing, while the Land Co-operative clashed with the Farmers Clubs of the Agricultural Extension Department in providing fertilisers and other agricultural inputs.[17] Careful enquiries had to be made therefore to establish the allegiance of any particular farmer, especially where two organisations were at work in the same village. In fact as Table VIII-3 demonstrates, this is not usually the case and the individual organisations tend to concentrate their activities in particular areas.[18] The confusion is, however, such that farmers were occasionally unaware of what facilities their own co-operative had to offer. Some talked of acquiring cheap fertiliser from the Agricultural Credit Co-operative, which then dealt purely in credit.[19] Others thought that the credit co-operatives might help them to improve the supply and control of irrigation water.

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16. Organised by the Department of Local Administration, Ministry of the Interior.

17. But see below for the re-organisation of these groups.

18. It should be noted that farmers are in theory not allowed to be members of more than one credit supply organisation. In practice dual membership could be gained through wives and sons-in-law, and some farmers were members of more than one organisation without borrowing from both.

19. From 1973 the A.C.C. added an input supply function.

TABLE VIII - 3

Co-operative Activities in Lam Pao Sample Survey Villages as of 1973

	A.C.C.	L.C.	Bank F.G.	Min of Ag F.G.	J.L.G.	W.U.A.
BAN NA CHUAK NUEA	x	x				x
BAN TUM		x	x	x		x
BAN UM MAO		x	x			
BAN FAI TAEK						x
BAN LEK			x	x		
BAN NON SUNG	x[1]	x				
BAN LAO YAI	x[2]				x	

1. Actually centred on Ban Nong Paen
2. Actually centred on Ban Non Khwaw

This confusion is clearly related to the fact that in all cases the co-operative organisations had been created not through the initiative of the farmers themselves but by the intervention and suggestion of government officers. This has led Hughes to refer to such associations merely as 'quasi-co-operatives'[20] and both he and Ward have suggested that this is an important factor in holding back farmer participation.[21] In the more recent foundations, efforts have been made to increase farmer involvement. In the Joint Liability Groups of the Thai Farmers' Bank the structure of the society means that farmers must carefully choose their fellow members; although the initial introduction to the scheme is made by bank officers, it is then left to the farmers to find a group of reliable and interested farmers if they wish to join the scheme. The recently established Land Co-operatives also have a large farmer component in their management committees. At Yang Talat, this committee was initially composed of five officers including the headman of Ban Na Chuak Nuea and two other well-known farmer leaders, the headman of Ban Por Daeng and the 'kamnan' of Tambol Hua Khua, both close to Ban Um Mao. When the organisation was being introduced to farmers, the presence of these three well-known figures on the committee was emphasised. By 1975 the committee was composed of the Provincial Co-operative Officer, his deputy and an officer of the Co-operative Extension Department along with twelve farmer leaders. The headman of Ban Na Chuak Nuea was president and another farmer was joint-secretary with the Co-operative Department Officer.

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20. Hughes, op.cit., p.3.

21. Ward, op.cit., p.12.

It has been emphasised above that the functions of the farmer organisations in agricultural development in Thailand as a whole and in Kalasin in particular, overlaps considerably. To establish the extent of this overlap and to assess the effect of the work of the various organisations in assisting farmers in the area, it is necessary to examine them more closely. This will be approached from two viewpoints; first the work of the individual organisations will be investigated at the district level to find out the full extent of their programmes, their methods of operation and the nature of their development policies; secondly, the effect of this work will be examined at the farm level with reference to the Lam Pao sample survey. In this way it should be possible to find out what the associations are aiming to do and compare this with their effect at the farm level.

The large number of organisations at present working in Kalasin province provides a difficult task of assessment in that functions overlap. The discussion which follows has been organised according to the two groups of problems identified above, namely the difficulties of organisation of the new irrigation facilities and the problems arising from the reorganisation of resources and the need for new facilities. As the most distinctive association and the most concerned with irrigation facilities, the Water Users Association will be considered first. In the later discussion, the other organisations will be discussed in turn, although a distinction will be drawn between credit societies and those incorporating other functions.

The Water Users' Association

In many respects the Water Users' Association is the most important of the farmers' associations in the irrigation projects of the Northeast of Thailand. The whole success of agricultural development based on the provision of irrigation water is dependent upon the efficient running of the irrigation system and the ability of the farmers to use it properly. If this is not the case, then the success of the development efforts of the other extension services and co-operatives is jeopardised.

Although the management of irrigation water in Northern Thailand has been a way of life for over 500 years, in the Northeast region no such tradition exists. The Royal Irrigation Department have seen from their experience in other projects in the Central Plain that, where no prior knowledge exists, farmers must be formally introduced to irrigation practices and must be made to feel responsible for the irrigation system which could be the basis of their lives.[22] Thus Water Users' Associations were created for the first time in 1963 during the intensive programme for the establishment of a series of tank irrigation projects, financed by the United States Operations Mission, in the Northeast region.

In the first place the objects of the Water Users' (Irrigation) Associations were relatively limited in scope

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22. Frutchey,Rose H., "Socio-Economic Observation Study of Existing Irrigation Projects in Thailand", Bangkok 1969, p.153.

with the basic aims of creating

> "..closer co-operation between irrigation water users and irrigation officers concerned for joint development and solution of problems in relation to proper water distribution." 23

and also

> "unity and mutual assistance in looking after the interests of the majority in the form of dikes and ditches and undertaking repairs to such structures that are damaged." 24

Latterly, however, it has been the hope of the Water Users' Associations to develop into more multiple purpose schemes to assist the farmers in a whole variety of ways. The Royal Irrigation Department (R.I.D.) now consider the following to be within the scope of the association:

(1) Supply of water pumps in case of emergency need on high ground

(2) Provision of water drainage facilities

(3) Land Consolidation

(4) Assistance with agricultural credit for land and machinery purchase

(5) Assistance with the employment of qualified personnel for administration of the irrigation facilities

(6) Attempts to get the best price for its members' produce. 25

Although such a programme is wide ranging, the Royal Irrigation Department recognises the need for co-operation with other agencies in the carrying out of these activities for the members of the Water Users' Association.

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23. Royal Irrigation Department, op.cit., p.8.

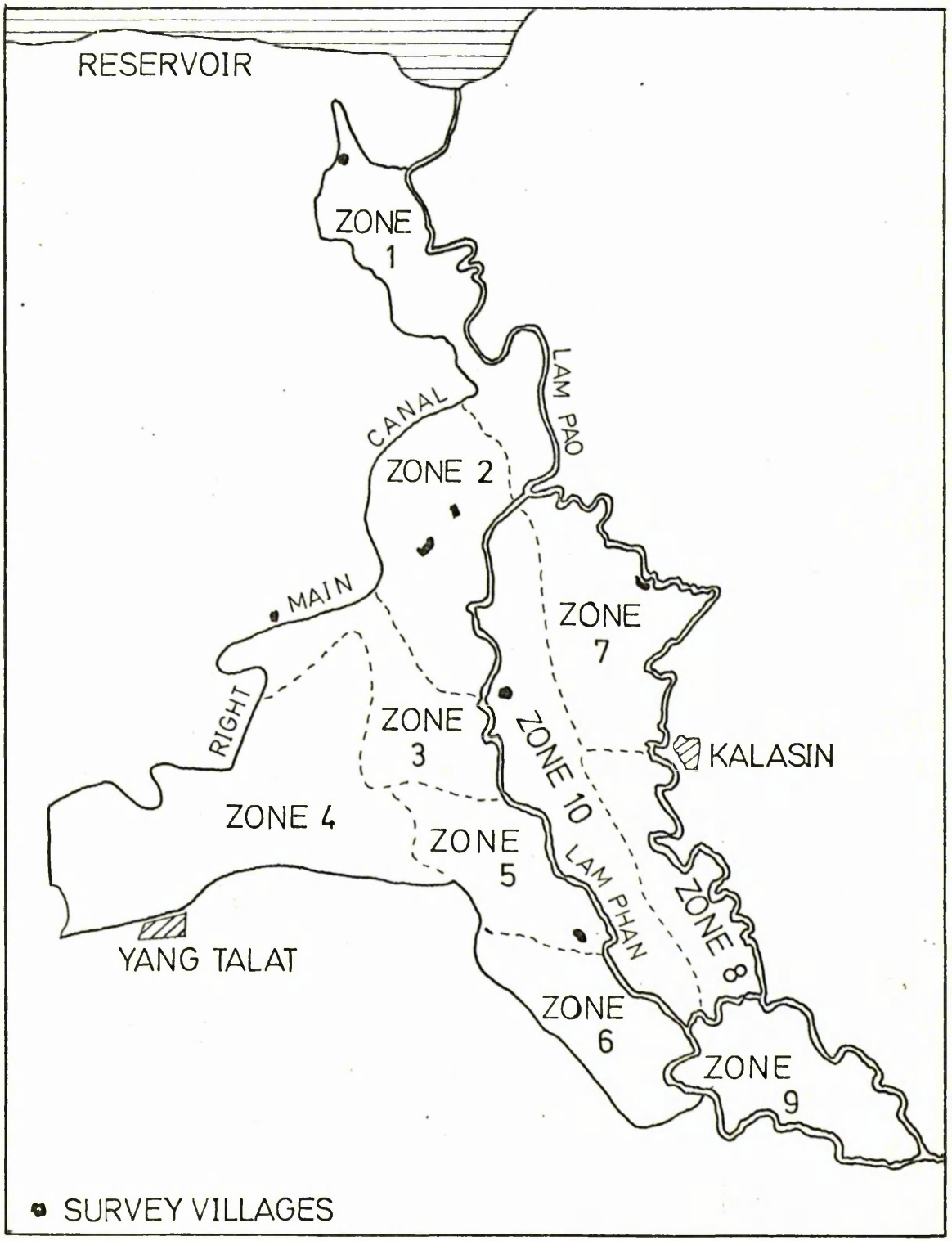
24. Ibid., p.9.

25. Ibid., p.13.

In the Lam Pao irrigation project area, the organisation of the Water Users' Association is still at an infant stage. Extension is still mainly concerned with establishing the association at the village level for water management rather than in extending the scope of its activities as outlined above. Even here the organisation of farmers into joining the association has met with problems. Construction and maintenance problems on the main distribution system have led to delays in the arrival of water at a number of villages and the associations have been the target for much complaint on this account.

Essentially, however, it is at the farm level that the Water Users' Association is designed to operate. The major irrigation projects of Northeast Thailand have been organised into a series of irrigation zones and below this there is planned a tiered structure based primarily on the 'irrigation unit' and secondarily on 'field units'. Each zone is under the control of a zoneman, who is an R.I.D. official, and each may be up to 10,000 rai in extent. Figure VIII-1 shows the layout of the zones in the Right Bank Stage 1 area of the Lam Pao project. The zones are divided into the irrigation units which can be up to 1000 rai in extent and which are under the control of the 'Common Irrigator', who is a farmer and must be a member of the Water Users' Association. Each of the irrigation units may be divided into a number of field units which comprise a group of 20-30 farmers taking water from a single feeder system; these units elect an irrigation assistant known as the 'ditch-rider' who is responsible for the maintenance of dykes and ditches in his unit, for the allocation of water and for recruiting labour for maintenance and repair. He too is a

FIGURE VIII-1
LAM PAO PROJECT : WATER MANAGEMENT ZONES
RIGHT BANK STAGE ONE



farmer and is responsible to the 'Common Irrigator' to whom he brings his major problems.[26]

In the Lam Pao project area problems have been encountered even at the initial stages of the organisation of the Water Users' Association. At Ban Fai Taek, the long wait between the construction of the lateral canal and the arrival of irrigation water made farmers distrustful and even hostile towards officials of the Water Users' Association when they came to announce the impending arrival of water in May 1972. Farmers had been using the rain-filled canal for fishing, for bathing and for buffalo wallows. They greeted with some derision the warning that in future they would be fined by the irrigation authorities for such practices; their long wait made them unenthusiastic about joining the association. Equally there have been problems in finding farmers willing to take on duties as common irrigator and ditch rider. Frutchey has pointed out similar difficulties in the Central Plain[27] and at Huay Sithon it was found necessary to employ paid skilled labourers in the role of common irrigator.[28] In Ban Na Chuak Nuea the farmer referred to above[29] was chosen as the village common irrigator, but he has continued to be a guard at the Lam

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26. The Common Irrigator has become part of the village structure, being regarded as another deputy headman with special responsibility for irrigation, in Thai 'phuchuay chonprathan'.

27. Frutchey, op.cit., p.103.

28. Pilgrim,J.W., "Social Planning for Rural Development", Bangkok 1972, Draft, Mimeo, p.61, footnote 1.

29. See above, Chapter IV.

Pao dam site and it is clear he has little time to carry out his irrigation duties fully.

Even when the association is established, the problems of the irrigation leaders have been numerous. Pilgrim, who visited the area in late 1971 and early 1972 on an observation mission, noted that in Ban Pho Si, farmer members were reluctant to help construct the very long irrigation ditch because they did not believe that the water could arrive or needed to arrive by the circuitous route which the configuration of the land required.[30] At Ban Na Chuak Nuea too, the Common Irrigator himself, having developed his irrigated plot, found his plans frustrated by the failure of his fellow farmers to agree on the final alignment of the farm ditch turnout no. 3.

Turnout no. 3 has been the scene of many problems since that time. Serving a vast area of 3500 rai, the main concrete-lined farm ditch has suffered extensive fracture, partly as a result of design deficiencies, partly through the misuse of farmers, particularly where an old cart track crossed the canal. Here no bridge was provided and buffaloes had been allowed to wade into and out of the canal to cross, thus cracking the sides. In August 1974 moreover, a particularly heavy storm, with 100 mm. of rain falling in a few hours, washed out the major junction box at the start of turnout 3 and increased the problem of water control. Heavy seepage and gravity outflow had caused severe flooding in low-lying land in Ban Na Chuak Nuea and the loss was such that the lands furthest away in Ban Wang Fang Daeng could not receive water.

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30. Pilgrim, op.cit., pp.73-4.

Farmers on Turnout 3 protested to the irrigation authorities and a dispute arose over whose responsibility repair and maintenance of the farm ditch system should be. Ban Na Chuak Nuea villagers saw a lined-ditch as the responsibility of the irrigation department who suggested that the farmers do the work themselves if materials were provided. The farmers felt that they did not have the technical skill to deal with concrete and pointed out the apparent lack of work of hired R.I.D. labourers. Nothing was done as the dispute wore on and it was notable that the Water Users' Association had no role to play. When questioned by village leaders in Ban Na Chuak Nuea, the Common Irrigator, one of their fellows, maintained that the association had only limited funds which could not extend to the undertaking of such work.

When the Water Users' Association is fully established and water begins to be received regularly over a large area, the work of the association is liable to grow rapidly. At Lam Phra Phlerng, the associations in zones 1 and 2 of that project each number hundreds of members and requests for assistance are numerous. Farmers' complaints at Lam Phra Phlerng are of two main types. The first concern the layout of the irrigation system and are particularly common in the pioneer zone 1. Long farm ditches and uneven land have meant that, particularly in the dry season, several farmers have been unable to get sufficient water onto their fields.[31] Some have used water pumps to raise the supplies available but in doing so have tended to make further problems for farmers further

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31. The same problems were being encountered in Lam Pao in 1974-75, mainly at Ban Tum.

along the ditch. A second group of problems also mostly affect farmers with plots further down the farm ditch. These people have also failed to receive sufficient or in some cases any water at all as a result of water piracy by farmers at the start of the ditch.

The second problem arises as a result of a lack of education or a lack of confidence in the use of the water by the offending farmers, who feel it necessary to have their fields permanently flooded without waiting for their turn on the water rota. As such, it is a matter which the Water Users' Association in liaison with the zonemen is capable of improving. The first group of problems, however, involve fundamental changes in either the distribution system or of farmers' land. It is clear at Lam Phra Phlerng that there is substantial water loss from seepage on the long ditches; some degree of farm ditch lining is called for, which is neither the policy of nor within the budget of the Royal Irrigation Department. Again the levelling of farmers' land within the project area to aid the flow of water is not official work and tends to be an expensive process.[32]

It is with these tasks that the Water Users' Associations might be expected to assist its members, as well as with routine maintenance of the farm ditches. Already at Lam Pao there are obvious cases of the need for maintenance work on farm ditches, as was the case with the turnout 3 sub-system even before the major damage mentioned above. Unfortunately, under the present structure of the association, even at the level of

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32. A rate of some 3000 baht per rai was noted by the I.B.R.D. survey in 1972-73.

development currently reached at Lam Phra Phlerng, there is a notable lack of funds. The Water Users' Association's only income is from the 20 baht membership fee paid by farmers on joining. Although there has been a suggestion that its funds should be augmented by farmers paying for the use of irrigation water to the tune of 2 baht for every rai planted using irrigation water and a further 2 baht for every rai then harvested, thus far income is limited to that deriving from membership fees and the Association cannot help its members in any material way. As a result, although farmers are all supposed to be members of the association, they are more reluctant to join when they can see no benefit in doing so. This reduces the funds yet further. Although co-ordination with the Land Co-operative, as at Lam Pao, can assist individual members, for larger group tasks, it would seem imperative for the Water Users' Association itself to have capital of its own available in order to make an effective and valued contribution to the development effort.

The presence of an effectively organised and regular supply of irrigation water is necessary if the other farmer associations in the irrigation areas are to be able to perform equally usefully. If the irrigation water is not reliable, then it may be difficult for farmers to repay loans. If floods and drought are a continued hazard, then the full benefit of fertilisers and other investments will be lost and farmers will be reluctant to make investments of this type and to borrow the necessary capital to do so. On the other hand, even when the water is flowing, the other farmer associations must of themselves be capable of responding to the new requirements of the farmers. The extent of their

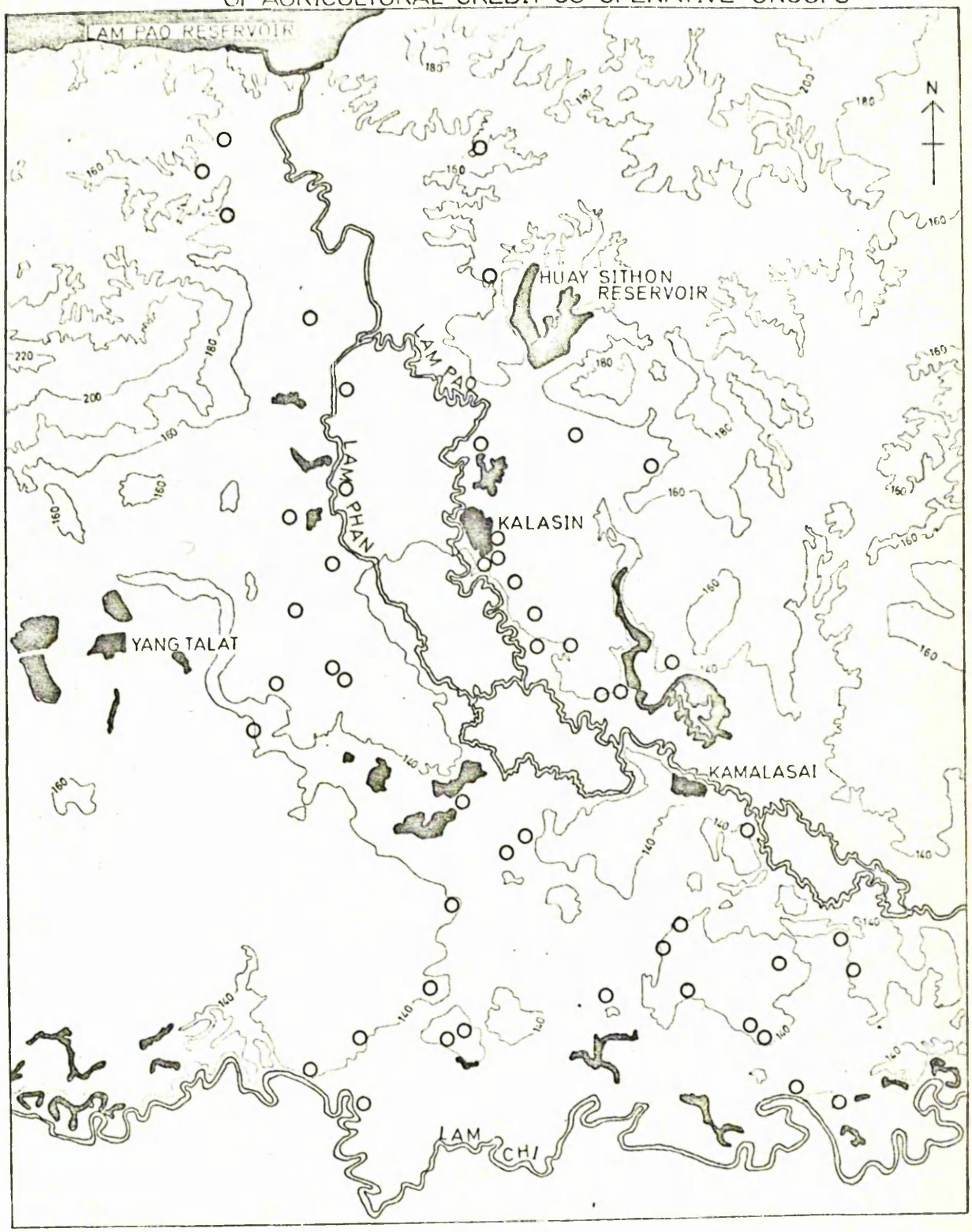
capability in this direction will be examined below.

The Agricultural Credit Co-operatives

The Agricultural Credit Co-operatives are the oldest of the farmers' associations at work in Kalasin province. They are organised on a two-tier basis, each district having its own society within which borrowers are grouped together at the village level into some twenty separate clubs. In each of the three districts within the Lam Pao irrigation area, the growth of the number of village groups has necessitated the division of the district level administration into two separate societies which work from the same office but whose officers are quite separate. In Kalasin this structure was instituted in August 1970, so that the co-operative has worked for over four years in this way. Since early 1972, a further re-organisation of the A.C.C.s has been planned involving an amalgamation with the Land Co-operatives and the abolition of the formal village level groups. The only distinction seems to be that the present Land Co-operative will work exclusively in the irrigated area and the A.C.C. outside it, but as Figure VIII-2 shows, the A.C.C. still has a significant presence in the irrigated lands at the present time.

The Agricultural Credit Co-operatives functioned prior to the present, as yet incomplete, re-organisation strictly as a supplier of credit to farmer members. Loans could be made on a short-term basis to be repaid within 12 months of the date of loan or on a medium-term basis, requiring payment within three years of the date of the transaction. On making an application for a loan, a farmer had to inform the district

FIGURE VIII-2 : LAM PAO IRRIGATION AREA LOCATION OF ACTIVITIES OF AGRICULTURAL CREDIT CO-OPERATIVE GROUPS



office in person, giving details of the intended use of the money. At this time he had to deposit with the society security equivalent to at least the land development certificate (N.S.3) or the full land title deed.[33] If he did not possess such a land certificate, then it was also possible for two other members of the group to act as guarantors for him. If the loan application was granted, the farmer had to repay the loan within the allotted time along with the interest charge of 1% per month. If he failed to do so, the Co-operative held onto the farmer's title deed or that of his fellow members and they were unable to borrow again until full repayment has been made. The same regulations for borrowing continue in the re-organised co-operative.

Although there is no regulation that a farmer must have a N.S.3 title deed to become a member of the co-operative, the loan regulations outlined above effectively mean that there is little point in a farmer without such a certificate joining the society for it is unlikely that he will be able to guarantee the help of his fellow members. Until a recent drive by the Land Department in Yang Talat district to measure and confirm boundaries of individual holdings, there were a large number of farmers in Kalasin province, and

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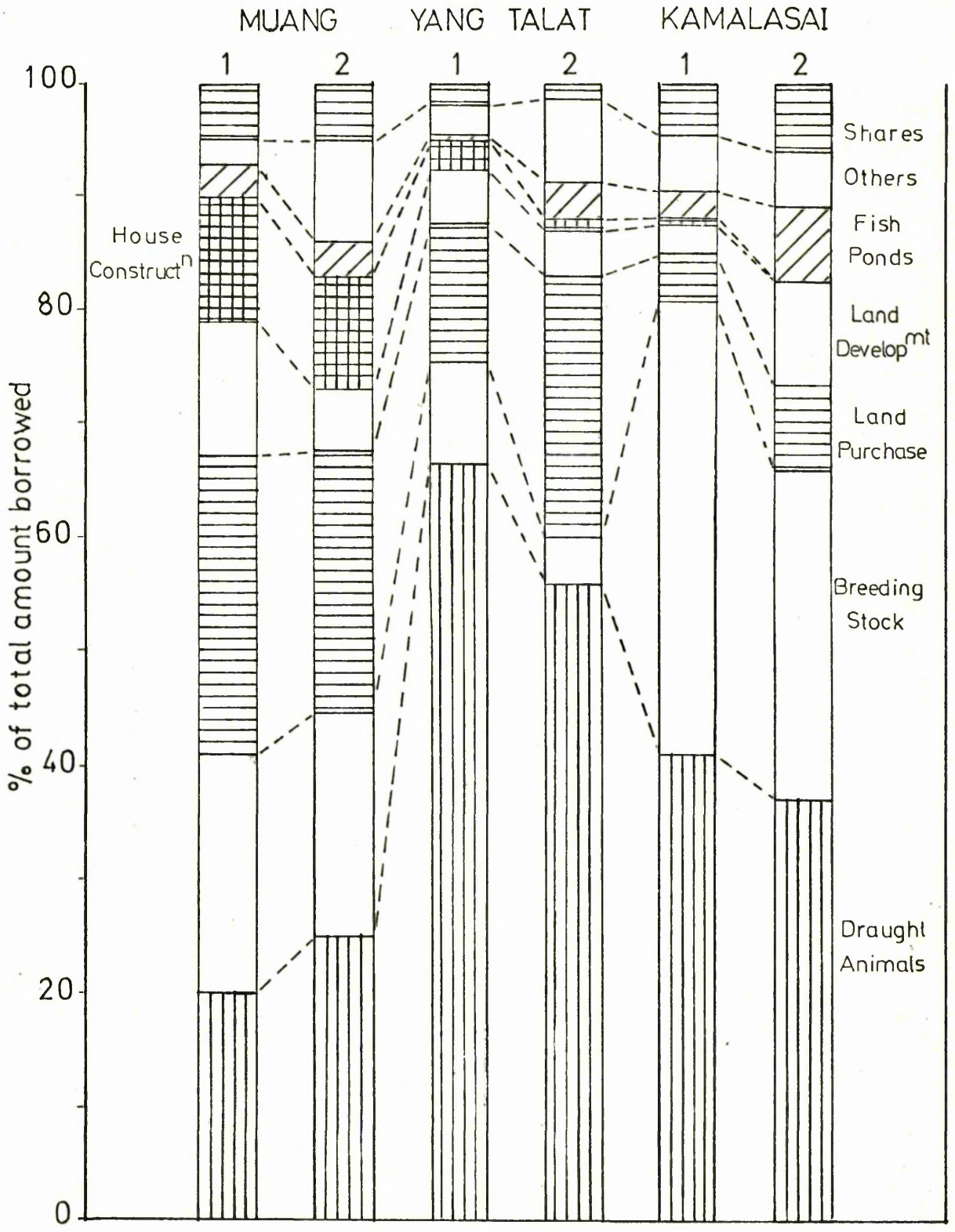
33. There are three basic types of land title in Thailand. The simplest is merely a land occupation certificate with a verbal description of the boundaries of the plot. It is known as the "Nangsue Sadaeng Khwam Mii Kamsit" or S.K.1. This is non-negotiable and not normally acceptable as co-operative security, unlike the "Nangsue Samkhan" (N.S.3), the certificate allowing a farmer to develop and sell his land. It contains a diagram of the plot with its dimensions and the names of the owners of the bordering plots. The final certificate is the full land title deed, the "Bay Chap Chong", which requires a complete survey of the farmer's plot.

still are in Muang and Kamalasai districts, who did not hold an N.S.3 certificate.

Up to March 1973, the end of the last financial year of their operations currently available for scrutiny, the structure of loans made by the A.C.C. societies in the three central districts of Kalasin province was dominated by the medium-term type. In the six societies in question, medium-term loans constituted at least 84.9% of the total loans made since 1970 and as much as 98.3% in the Yang Talat No. 2 society. Since their inception, the A.C.C.s have handed out nearly 19 million baht in medium-term loans, averaging 4213 baht for each of the 4491 individual loan contracts.

The medium-term loan made by the A.C.C. is supposed to take the form of an agricultural investment, although it is clear that the societies themselves have taken a rather broad view of what constitutes agricultural investment. In the two Muang district societies, indeed, 11% and 10% of the total loans made since 1970 have been used for the non-agricultural purpose of house construction. Of the loans made for obviously agricultural purposes moreover, the pattern is dominated by what may be termed 'traditional' uses, such as the extension of the farmers' holdings and the purchase of work animals. Figure VIII-3 shows the proportional distribution of medium-term loans made by the six district societies. It will be observed that the most important loan purposes are overwhelmingly the purchase of draught animals, the purchase of large livestock for breeding purposes and the purchase of land. As has been noted in a previous chapter, these items are very much the traditional items of investment in the

FIGURE VIII-3
AGRICULTURAL CREDIT CO-OPERATIVES
KALASIN PROVINCE
USE OF MEDIUM-TERM LOANS



Source : Thii Tham Karn Sahakorn
Changwat Kalasin

semi-subsistence economy, with its belief in the security of land holding and the ease of capital multiplication through livestock breeding. An important subsidiary use of loans is for 'land development', but rather than an improvement of existing land resources, most of loans under this head were said to have been made for the clearance of more of the forested upland area and represent once again a continuation of the old pattern. Most of the loans for this purpose in Muang district have not in fact been to farmers within the irrigated area, but rather to farmers seeking to clear land for cassava and kenaf cultivation in the Lam Pao resettlement scheme to the northeast of the dam site.

Considering the use of loans for the purchase of draught animals in particular, not only is this use highly traditional, but it seems also that the co-operative societies are providing the farmers merely with a means of short-term capital circulation. This is what the F.A.O. call

> "Static anticipatory loans. Without contributing to an increase in production they only enable the farmer to tide over the period before his harvest (in the case of short-term loans). A not unimportant proportion of medium-term loans has a similar character in as much as they allow him to spread out over a relatively long period the considerable expenditure he has to make at once." 34

Within the A.C.C. societies at Lam Pao the bulk of contracts signed for the purchase of draught animals are made in the first three or four months of the year just prior to the start of the ploughing season, beginning on the upland in March or April. Farmers retain the beasts until the end of the main

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34. Food and Agriculture Organisation, "Agricultural Credit from Co-operatives and Other Institutions", Rome 1965, pp.53-4.

TABLE VIII - 4

Proportion of Short-term Loans in Total Amount Borrowed. Agricultural Credit Co-operatives, Central Kalasin 1970-73

%

Society	Aug.70-Mar.71	Apr.71-Mar.72	Apr.72-March 73	Overall
Amphur Muang 1	1.0	25.8	26.8	12.1
" " 2	14.7	25.8	11.6	15.1
Yang Talat 1	.....	1.1	8.5	4.7
" " 2	.....	0.2	8.0	2.9
Kamalasai 1	2.6	2.2	1.1	1.7
"	6.3	8.9	10.7	9.7

period of land preparation and then, so the dates of livestock sales in the Lam Pao sample survey would seem to suggest, sell them off again to repay the loan. The loan may assist the farmer to carry out his agricultural activities for one or more seasons in this way, but it does not effectively improve his overall position. Moreover, the fact that the loans for draught animals dominate all loans made by the A.C.C. means that the activities of the societies are concentrated into a few months of the year and during the main production period they make few loans.

Short-term loans offered by the A.C.C. societies in Kalasin, although they only constitute some 9.9% of the total number of loans contracted and only 7.0% of the total amount borrowed, do show a greater concentration on immediate production activities. Hire of labour for agricultural purposes and the purchase of pigs and poultry for rearing are among the most important uses for the short-term loans, although it seems that the majority of the money borrowed to hire labour is again being used for the cultivation of cassava and kenaf in the upland areas. The 1972-73 figures for Amphur Muang suggest that a great deal of money was being used for tractor ploughing of the upland. (Tables VIII-4 and VIII-5).

In so far as the short-term loans given by the credit co-operatives do assist the farmer to improve his productive capacity, they are to be welcomed, but in only three of the six district-level societies do short-term loans make up as much as 5% of the total and short-term loans in Yang Talat as a whole are almost negligible. Even where the short-term loans have begun to grow in importance, there remain problems

TABLE VIII - 5

Short-term Loans by Purpose Agricultural Credit Co-operatives, Lam Pao Area Societies, August 1970-March 1973

%

	Muang 1	Muang 2	Y Talat 1	Y Talat 2	Kamalasai 1	Kamalasai 2
Hire Labour						
(a) Ploughing	25.8					
(b) Planting	8.8					
(c) Weeding	3.1					
(d) Harvesting	1.1					
(e) GENERAL	21.8	63.6	26.4	32.0	-	26.7
Tractor Hire	9.7	-	-	-		
Pig Rearing	16.0	13.2	19.4	33.7	72.2	68.3
Poultry Rearing	2.0	1.6	-	4.5	20.6	
Land Rent	1.8	-	-	3.9	-	
Cassava Cultivation	011	3.2	-	18.4	-	
Kenaf Cultivation	-	8.6	-	-	-	
Land Development	-	-	42.3	-	-	
Seed, Fertilizer, etc.	1.9	-	2.4	-	2.1	
House Construction	-	-	4.3	-	-	
W. Melon Cultivation	-	-	-	2.6	-	
Others	2.5	-	0.6		-	-
Shares	5.0	4.8	4.7	5.0	5.1	5.0
	100.0	100.0	100.0	100.0	100.0	100.0
Total Amounts Borrowed (Baht)	332,900	319,200	77,700	31,050	48,000	225,500

Sources: Thii Tham Ngarn Sahakorn, Amphur Muang Kalasin, Amphur Yang Talat
Amphur Kamalasai, Changwat Kalasin
(District Offices of Agricultural Credit Co-operative)

of repayment. If a co-operative has fundamentally improved the position of its members by lending them money, then their productive capacity should be increased to the extent that they should have no problems in repaying the capital. In Kalasin the recent re-organisation of the societies means that any assessment of the medium-term loan repayment rate, with its three-year repayment period, is precluded. On the other hand, it is possible to assess their performance over the matter of short-term loans for which repayment is due within one year.

An examination of the figures for the Amphur Muang societies which have a more complete record and which have the greatest incidence of short-term loans shows that their record is not very impressive. In April 1971, the No. 1 society had 55 short-term loans still completely unpaid, totalling nearly 110,000 baht; in the course of the year 95 new loans were made and 63 old loans were repaid. It was therefore not impossible that all the outstanding loans from 1970-71 could have been repaid by the end of the 1971-72 financial year. However, in the following year, only 22 new loans were made and 8 of the outstanding loans repaid, leaving a total of 101 loans outstanding by April 1973. At least 79 of these must have been overdue, totalling some 170,460 baht and representing at least a 47.6% shortfall on the total borrowing from 1970-72. (Table VIII-6).

The position was similar for the No. 2 Society. At the start of the 1971-72 financial year, 57 old loans amounting to 123,000 baht were outstanding. By April 1972, 75 new loans had been made with only 27 repayments. This left a possible 70,170 baht outstanding on the 1970-71 period or a shortfall of

TABLE VIII - 6

Repayment Record, Agricultural Credit Co-operative, Amphur Muang, Kalasin, 1971-73

	No. 1 Society			No. 2 Society		
	No.	Baht		No.		
Short-term loans Outstanding March 1971	55	(109,843)		57	(122,896)	
Borrowed during year 1971-2	95	(247,850)		75	(170,800)	
Total (to March 72)	150	357,693		132	293,696	
Repaid 1971-2	63	113,886		27	52,726	
Outstanding	87	243,806		105	240,970	
Overdue from March 71		-		30	70,170	(57.1%)
Borrowed during year 1972-3	22	56,000		67	205,700	
Total Borrowed to March 73 (outstanding)	109	299,800		172	446,670	
Repaid 1972-3	8	73,466		?	136,570	
Outstanding	101	226,334		?	310,100	
Overdue from March 72	79	170,334	(68.7%)		104,400	(61.1%)

Source Thii Tham Karn Sahakorn, Amphur Muang Kalasin

at least 57.1%. The following year the picture was equally poor, with 241,000 baht outstanding at the beginning of the year and 206,000 baht borrowed during the year, April 1973 saw some 310,000 baht still outstanding. If it is assumed that all the money owing from 1970-71 had since been repaid and that none of the new loans had been repaid, then the amount owed from 1971-72 was 34,230 baht or 20.0% of the principal borrowed.

Although the record of the other societies does not show such failures, with the exception of Kamalasai No. 2 society, the total amount of short-term loans made in the period 1971-73 is negligible compared to the Muang district societies. The failure to get repayment on short-term loans suggests that there may equally be a problem on medium-term loans too. This is particularly a problem where the loans made by a co-operative are not strictly tied to production purposes, for then the co-operative cannot rely on its loans generating the capital for repayment. As has been noted above, many of the loans made to members of the A.C.C. have been of doubtful capacity to affect an improvement in the farmers' capital position. Although the Agricultural Credit Co-operatives in Kalasin province have moved away from their previous role in re-financing old debts,[35] they still have something of the social welfare aspect about their operations.

Under the rules of the A.C.C. failure to repay a loan means that a farmer is unable to borrow again; as a result he has no further interest in a co-operative of this type.

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35. Debt re-financing was only recorded in Kamalasai No.2 society, where it constituted only 1.4% of loans made between 1970 and 1973. Conversely some farmers were using non-institutional loans to repay their co-operative debts!

Hughes comment that a co-operative must make a profit is all important here.[36] If the credit societies in Kalasin fail badly in their search for repayment, they lose both profits and members. Since the re-organisation of 1970, this has perhaps been reflected in the societies' membership trends, which with the exception of the Kamalasai groups has been falling steadily. (Table VIII-7). This exception is not so much a function of the greater successes achieved in Kamalasai, but rather of the lesser development of the newly established Land Co-operatives in that district. Where in Yang Talat and in Amphur Muang the latter has made most progress, so the Agricultural Credit Co-operatives have declined. In the Lam Pao area this to some extent reflects official policy, but it may indicate also that farmers themselves have not found the A.C.C. societies very useful. With their poor repayment record and traditional loan policies, it is perhaps as well that the amalgamation with the Land Co-operative is taking place.

The Bank for Agriculture and Agricultural Co-operatives

The Agricultural Credit Co-operatives receive the bulk of their resources for lending to their members from the government via the local branch of the Bank for Agriculture and Agricultural Co-operatives. The Bank (B.A.A.C.) lends money to the co-operative societies at 9% interest rate per annum compared to the 12% per annum charged by the societies to their members.

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36. Hughes, op.cit., p.48.

TABLE VIII - 7

Membership Trends A.C.C.s
Kalasin Province 1970-3

Society	August '70	March '71	March '72	March '73
	No. Families			
Muang No. 1	413	477	466	435
Muang No. 2	276	525	454	456
Yang Talat No. 1	-	489	452	414
Yang Talat No. 2	-	440	380	342
Kamalasai No. 1	-	467	575	586
Kamalasai No. 2	-	449	467	508

Source Thii Tham Karn Sahakorn, Amphur Muang Kalasin, Amphur Yang Talat, Amphur Kamalasai, Changwat Kalasin.

The Bank for Agriculture and Agricultural Co-operatives established a branch in Kalasin province in 1969. Since then it has expanded rapidly, founding branch offices successively in the districts of Yang Talat, Kamalasai, Kuchinarai, Somdet, Sahatsakhan and Khaw Wong.[37] At the same time, the provincial office in Kalasin has moved into new, modern premises. Apart from providing capital to the other co-operative societies at work in the province, the B.A.A.C. is able to lend money direct to individual farmer borrowers.[38] However, for ease of organisation and in order to have more security against repayment defaults, the Bank insists that farmers should be members of small joint liability farmers' groups. At the village level, the Bank is anxious that these groups should be tightly-knit clubs of mutually trustworthy farmers with a maximum of 12-14 members.

Loans granted by the Bank to the members of these Farmers' Groups are regulated very much in the same way as in the Agricultural Credit societies. Loans may be given for periods of twelve months or three years, or even in special circumstances for a longer period, and in each case there is an interest charge of 12% per annum. Originally the maximum loan was limited to 5000 baht per person, but this was increased to 10,000 baht in 1972 and again to 20,000 baht in 1974. A farmer's credit-worthiness is, however, generally

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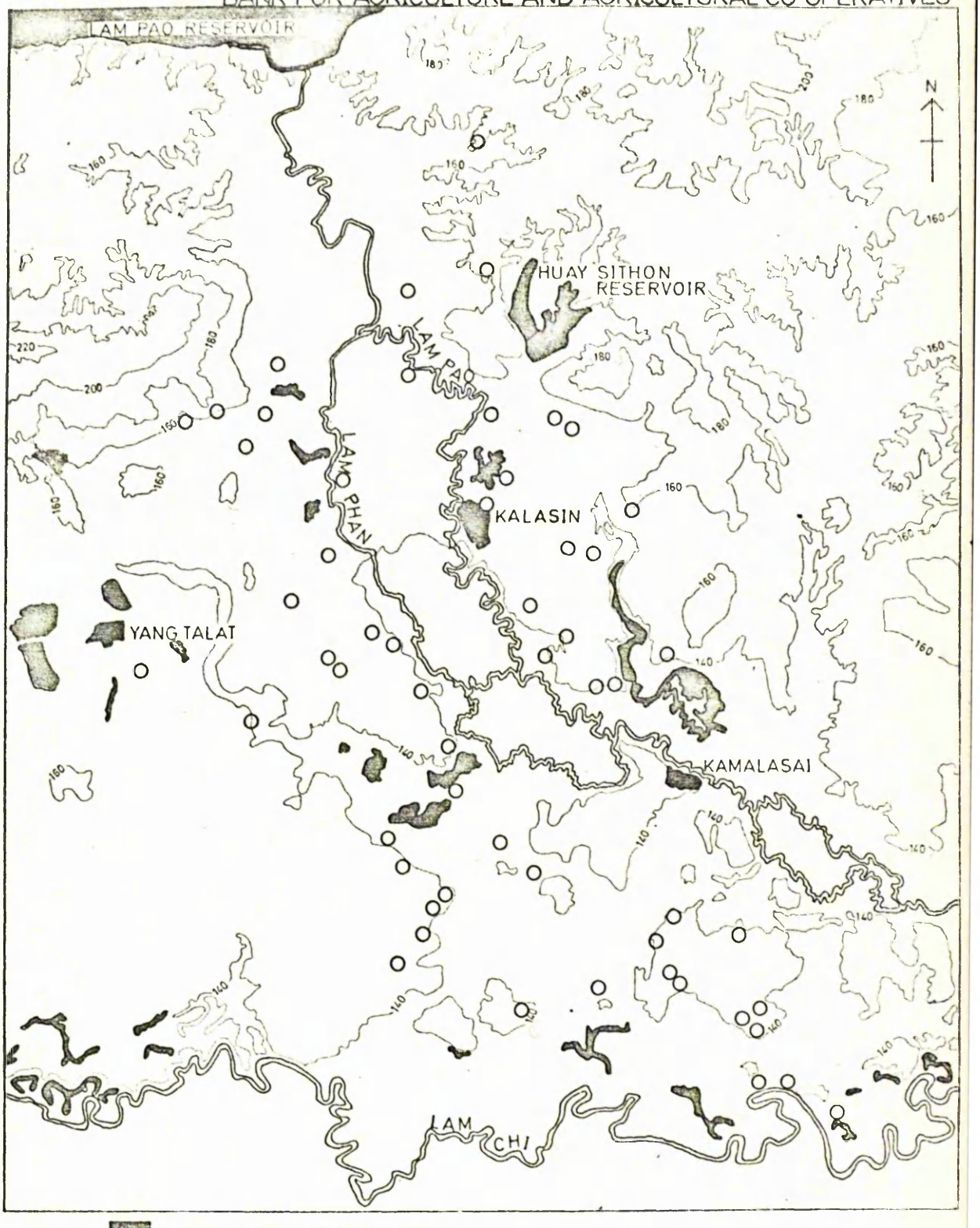
37. In 1975 the Yang Talat office closed and its business was transferred to the main office in Kalasin.

38. F.A.O./U.N.D.P., "Agricultural Credit in Thailand with Special Reference to Fertiliser Use", Bangkok 1971, p.46. note that, in 1970, loans to individual farmers totalled 563 million baht against loans to co-operatives of 168 million.

FIGURE VIII-4 : LAM PAO IRRIGATION AREA LOCATION OF ACTIVITIES OF BANK FOR AGRICULTURE AND AGRICULTURAL CO-OPERATIVES



assessed according to the amount of land or other fixed assets he may hold. Farmers do not have to possess a mortgageable land title deed in order to borrow, but in its absence, they must have two other members of their group stand as guarantors. Although loan applicants should carefully set out the intended purpose for which they will use the loan, the Bank's officers also make a point of visiting each of the farmer borrowers in the course of a crop season to check that the loan has been used for that stated purpose. The district offices of the Bank are open only two days a week to allow their occupants to make these inspections. Each village group has a leader, but this man's task is merely to communicate Bank policies to its members rather than to judge and supervise their loan applications.[39]

Since its foundation in 1969, the Kalasin branch of the Bank has established 360 groups in the seven districts of the province now with branch offices, with a total membership of 4875 households. In the three districts within the Lam Pao irrigation project, there were 238 groups with 2,990 members in 1973. (Groups within the irrigation area are located in Figure VIII-4). As Table VIII-8 demonstrates, the number of farmers making use of the Bank's loan service is extremely high and the Bank's official figures seem to be confirmed by the situation in the two groups in Ban Um Mao in the Lam Pao sample survey. One group leader interviewed in 1971 noted that all the group's twelve members had

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39. The leader of one group in Ban Um Mao was unable to supply details of the regulations for borrowing without reference to his handbook.

TABLE VIII - 8

Bank for Agriculture & Agricultural Co-operatives
(Kalasin)
Membership Trends and Patronage 1972-3

District	Membership March '72	Membership March '73	No. Persons Borrowing 72-73	% Patronage
Muang Kalasin	1544	1505	1469	97.6
Kamalasai	557	593	588	99.2
Yang Talat	863	892	876	98.2
Somdet	431	506	497	98.2
Sahatsakhan	-	137	123	89.8
Kuchinarai	672	704	690	98.0
Khaw Wong	544	539	503	93.3
Province	4611	4876	4746	97.3

Source: Bank for Agriculture & Agricultural Co-operatives, Kalasin

borrowed money; in the following year, the leader of the second group reported a similar situation.

Throughout the province, since its foundation, the Bank has made available over 32 million baht to its farmer group members, not including those loans given to district co-operative organisations. It has been the B.A.A.C. policy that most of the loans should be of the short-term variety to assist the production processes in the immediate cropping season.[40] Typical of the uses which this policy favours are the purchase of seeds, fertiliser and insecticides, the hire of tractors and the hire of labour, the purchase for rearing of small livestock like pigs, ducks and chickens and the construction of fish-traps and fish ponds. In 1970-71, loans of this nature for repayment within twelve months constituted approximately 76% of the total amount of loans issued.[41] In the following year the emphasis on short-term loans increased further to 88.1% and by 1972-73 it had risen to 91.4%.

The use of short-term loans issued by the B.A.A.C. is classified generally according to the crop type or livestock enterprise to which the loan is put. Table VIII-9 shows the pattern of these short-term loans by enterprise and it is interesting to compare the distribution for the two years of operation presented. There was a substantial shift in the pattern of loan distribution, a shift suggesting that

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40. F.A.O.-U.N.D.P., op.cit., note that short-term credit given by the B.A.A.C. increased in importance from 50% in 1967 to 75% in 1970.

41. Personal Communication, Khun Praderm Suchayanon, Manager, B.A.A.C. Kalasin.

TABLE VIII - 9

Bank for Agriculture and Agricultural Co-operatives. Short-term loans by Enterprise 1970 and 1971

Enterprise	Amount (Baht)	%	Amount (Baht)	%
Rice Cultivation	6,047,280*	83.99	6,831,435	64.52
Kenaf Cultivation	527,760*	7.33	1,891,033	17.86
Water Melons	15,840*	0.22	21,176	0.20
Sweet Potatoes	4,320*	0.06	-	-
Mung Beans	2,880*	0.04	-	-
Cassava Cultivation	720*	0.01	5,294	0.05
Pig Rearing	563,400*	7.82	1,650,683	15.59
Poultry Rearing	25,200*	0.35	174,703	1.65
Fishing	12,960*	0.18	13,765	0.13
	7,200,000*	100.0	10,588,090	100.0

* Approximate figures. Total supplied by Khun Praderm Sucayaanun, Bank for Agriculture and Agricultural Co-operatives, Kalasin.

Source: B.A.A.C. Kalasin

the Bank has been helping farmers to organise their agricultural activity to take advantage of the best economic opportunities. In 1970, the pattern of loan use indicates a drawing-in of horns in the direction of a subsistence economy. Kenaf prices had been low and farmers seem to have felt that concentration on rice would be more profitable.[42] Similarly prices of livestock in the province were also low with pigs fetching a mere 5-6 baht per kilogramme. By 1971, the situation was changing with kenaf having recovered to over 2.0 baht per kilogramme by the harvest season and rising higher thereafter. At the same time prices for both pigs and poultry had improved, pigs to over 10 baht per kilogramme, and this fact coupled with the low price of rice at the farm level[43] had encouraged farmers that a better return might be made by rearing small livestock on their surplus rice.

Unfortunately the 1972-73 breakdown of the pattern of short-term loans issued by the B.A.A.C. is not available in sufficient detail to assess the further operation of the Bank in these terms as rice prices have recovered and as the rise of cassava has continued, but the pattern in 1970-72 does seem quite encouraging with farmers able to take advantage of price trends through the loans. The relatively small amount of medium-term loans issued are, on the other hand, of the strictly traditional type observed in the case of the Agricultural Credit Co-operatives. Repayment of old

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42. Kenaf had been as low as 0.5 baht/kg. in late 1969 and early 1970.

43. As low as 0.5 baht/kg. in the harvest season of 1970-71.

debts still constitutes a small proportion of loans and investment is chiefly channelled into the purchase of livestock and land to maintain the old agricultural system. Perhaps the increased investment in breeding stock is a little encouraging, but overall the pattern does not appear likely to increase overall productive capacity. (Table VIII-10)[44]

In comparison with the Agricultural Credit Co-operatives, the repayment record of the B.A.A.C. farmers' groups is generally quite favourable. Out of the total amount of loans of all types made between the foundation in June 1969 and March 1973, almost four-fifths had been repaid on time. Of the total overdue, 1.78 million baht were in medium-term loans and could not be regarded as shortfall and the total amount owing on short-term loans was well inside the total short-term loan during the year 1972-73. Bank officials admitted that there had been some repayment problems; in June 1970 it was estimated that 12% of farmers had not repaid their loans from the previous season; in the following year, 30% of all borrowers were still in debt at the same time; in June 1972, the proportion of offenders was a rather lower 20%.[45] However, it is clear that the majority of these defaulters were able to pay at a later date and the Bank recognises the difficulty of pressing for repayment.

As a Bank official noted, in practice, it was preferable to wait for repayment rather than press the guarantors of a

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44. The investment in breeding stock, especially Brahman cattle, has proved to be a very valuable trend as prices of both cattle and buffalo have increased substantially since 1973.

45. Personal Communication, Khun Praderm Suchayanon, Manager, B.A.A.C. Kalasin.

TABLE VIII - 10

Bank for Agriculture and Agricultural Co-operatives. Medium-Term Loans by Enterprise 1970 and 1971

Purpose	1970 Amount (Baht)	%	1971 Amount (Baht)	%
Draught Animal Purchase	1,151,840*	50.08	568,208	39.73
Breeding Stock, Purchase	203,780*	8.86	472,529	33.04
Land Purchase	382,030*	16.61	189,641	13.26
Land Clearing and Development	497,260*	21.62	111,124	7.77
Water Pumps	9,430*	0.41	7,723	0.54
Agricultural Implements	-	-	4,720	0.33
House, Construction	23,230*	1.01	12,585	0.88
Fish Pond Construction	20,930*	0.91	49,770	3.49
Re-finance Old Debts	6,900*	0.30	13,873	0.97
	2,300,000*	100.0	1,430,173	100.0

Source: Bank for Agriculture and Agricultural Co-operatives, Kalasin Province

* Approximate figures supplied by Khun Praderm, Sucayaanon, Manager B.A.A.C. Kalasin

defaulting farmer.[46] In any case the situation such as arose in Ban Um Mao in the 1970-71 crop season was not uncommon. Of the twelve members of one of the farmers' groups in that village, not one had completely repaid his loan by June 1971. According to the group leader, repayment would be particularly difficult. Prices in the village had been very low with as little as 0.35 baht per kilogramme being received for rice and a number of farmers had also been hit badly by flood damage.[47] Nevertheless it would appear that at least some of the group did manage to repay in due course and were borrowing again in subsequent years.

In being both flexible and understanding about their loan policy, the officers of the Bank for Agriculture and Agricultural Co-operatives in Kalasin province seem to have gained the confidence of their members. The high rate of borrowing and of repayment of the short-term loans suggest that the emphasis on these with their immediate use on farm operations is helping the farmer members. Farmers have been able to finance their current enterprises and have been able to take advantage of changes in comparative profitability of the various alternatives for their capital. It appears a good policy to concentrate on such short-term lending and the amount loaned on a longer term basis has been falling. The concentration on short-term loans and the insistence on the organisation of farmers into mutually trustworthy groups has helped the Bank to maintain the viability of its business. Once again, however, it should be noted that such an

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46. Ibid.

47. See above, Chapter IV, Table IV-6a.

organisation does favour those farmers in the already secure capital position.

The Thai Farmers' Bank

Despite the increasing amounts of credit being made available to the farm population by the Bank for Agriculture and Agricultural Co-operatives, the Thai government has felt that there are still too many farmers without access to cheap institutional credit. In the last decade, it has encouraged the commercial banks in Thailand to take part in lending money to farmers on the same basis as the B.A.A.C. Naturally the commercial banks have been hesitant in entering this field. As commercial organisations they cannot afford the loss of funds to defaulting farmers; the cost of reaching a mass of small farmers is equally difficult to bear. Investment in industrial enterprise is much safer and more profitable.

It required the institution of the Accelerated Rural Development programme in 1966[48] along with definite guarantees from the government against repayment defaults to persuade the commercial banks to institute farmer loan schemes.[49] All the banks have followed the same formula in organising their programmes. They require farmers to join together in joint liability groups to guarantee the loan of individual members, giving security to the banks and easy collateral for the farmers. Loans are exclusively of a short-term nature and

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48. Generally designed for work in areas of political discontent in the kingdom and heavily backed by United States finance.

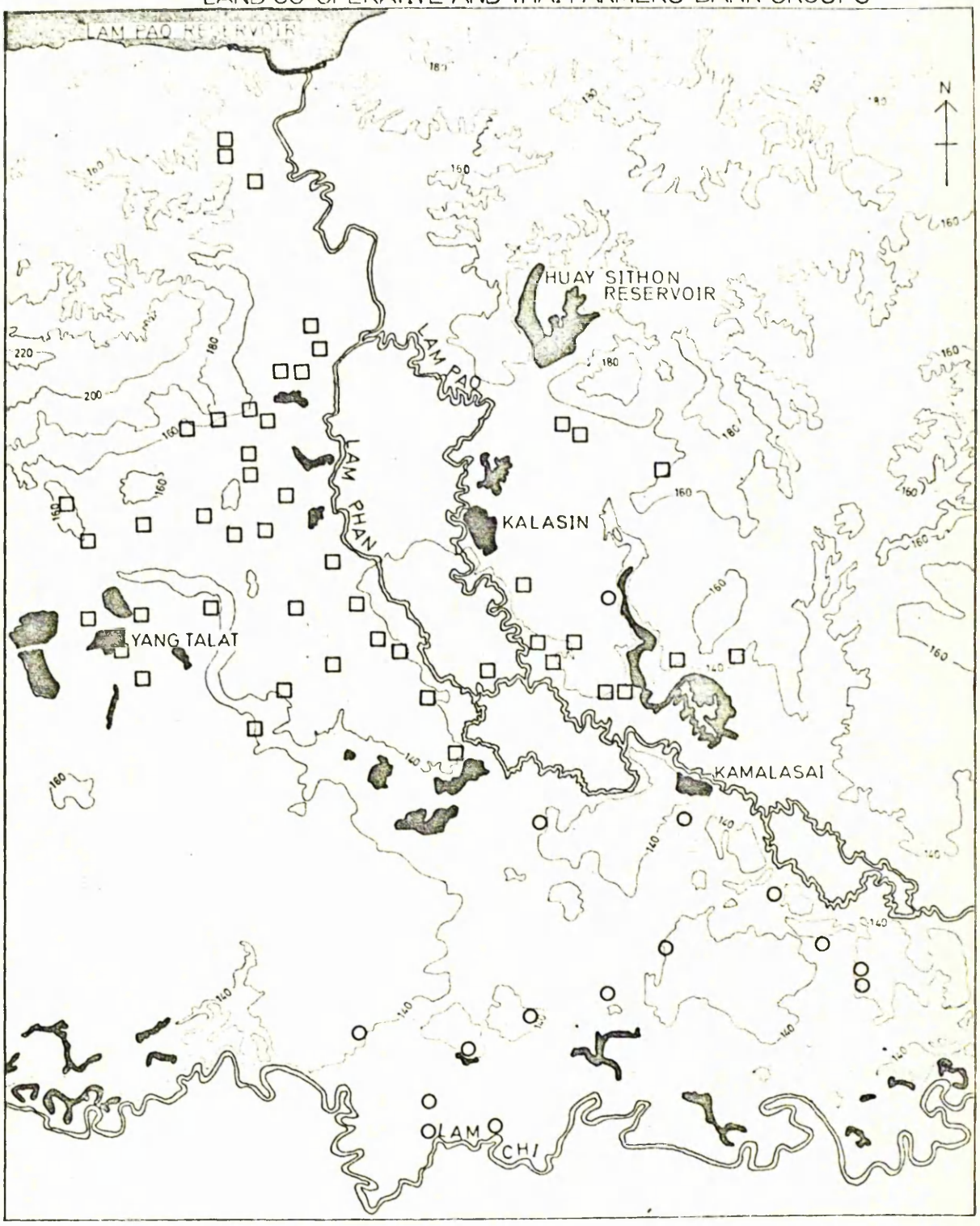
49. The Bangkok Bank actually began operations in rural credit in 1963. (F.A.O.-U.N.D.P., op.cit.,p.61).

each individual is allowed up to 5000 baht. The possession of a mortgageable land title deed (N.S.3) is not necessary and a certificate of land occupation (S.K.1) is adequate, but each borrower must have guarantors within his group.

At present two commercial banks, the Krung Thai and the Thai Farmers' Bank have been established in Kalasin province, but only one of these, the Thai Farmers' Bank has been active in issuing loans to farmers. Its operations began in association with the Accelerated Rural Development (A.R.D.) programme in Kuchinarai district in 1967, but since then the Bank has expanded its operations independently. Within the Lam Pao irrigation area, the work of the Thai Farmers' Bank has been mainly concentrated in Kamalasai district, (Figure VIII-5) which has 31 of the 34 groups founded by May 1973. In this district, the establishment of the farmers' groups has been actively encouraged by the District Agricultural Officer. Although the Bank itself has a small extension staff of its own, it has been by this method that the services of the Bank and the nature of its regulations have been explained to the farmers. After such visits to a particular village, it is entirely up to the initiative of the farmers themselves to organise a group if they wish and to register its existence and the members' names with the Bank. Groups range from a minimum of six to a maximum of 18 members.

As was noted above, the Thai Farmers' Bank offers only short-term loans. These are similar to those offered by the B.A.A.C., concentrating on immediate production purposes for repayment within twelve months. Officers of the Bank were unable to provide a detailed breakdown of the pattern of use, but production loans for rice and kenaf cultivation were said

FIGURE VIII-5 : LAM PAO IRRIGATION AREA - LOCATION OF ACTIVITIES OF LAND CO-OPERATIVE AND THAI FARMERS' BANK GROUPS



to be dominant.[50]

The overall record of the Thai Farmers' Bank joint liability groups is impressive. In the first year of operation of the independent groups, 1970-71, some 100 farmers out of a total membership of 187 had borrowed funds and all had been repaid. By 1971-72 the number of borrowers had reached 379 and the amount borrowed had risen to over 1 million baht; again all had been repaid. For the 1972-73 crop season, some 340 contracts had been made totalling 1,077,000 baht and repayment remained promising. This repayment record is exemplary and few problems have been encountered. Perhaps it has been fortunate that the years since the foundation have been relatively good in Kamalasai district, for F.A.O.-U.N.D.P. noted as early as 1970 quite extensive repayment problems besetting the commercial banks in general.[51] (Table VIII-11).

Perhaps it is not entirely surprising that repayment should have reached a very high level, however, for, like the Farmers' Groups of the B.A.A.C., these groups are quite exclusive. Although the requirements for loan are not restrictive, the joint liability character of the groups means that members are carefully selected so as not to jeopardise the position of their fellows. Naturally the farmers with the greater assets are the typical choices once again.

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50. Personal Communication, Khun Wanit Phrompraphan, Manager, Thai Farmers' Bank, Kalasin.

51. But even by 1975, the deputy manager of the Thai Farmers' Bank in Kalasin proudly reported that the 100% loan repayment had been maintained in Kamalasai and Muang district.

TABLE VIII - 11

Agricultural Credit Lending by Commercial Banks

1967-70

Year	Bank of Ayudhya		Thai Farmer's Bank		Krungthai Bank	
	Amount (000 Baht)	% Repaid	(Amount (000, Baht)	% Repaid	(Amount 000 Baht)	% Repaid
1967	727.8	95.6	1,197,4	99.7	1,450.0	99.7
1968	2,817.1	89.6	1,974.1	95.0	6,257.0	78.1
1969	3,723.6	86.9	3,738.1	93.1	3,464.0	72.5
1970	15,907.5	N.A.	6,618.2	N.A.	1,903.2	69.8

Source: UNDP/SF Soil Fertility Research Project in Thailand Working Paper No. 5. Tables 30-32

The Farmers' Clubs

The societies considered thus far have been concerned exclusively with the provision of credit facilities for farmers. It is clear, however, that this is not the only role of farmer associations in Thailand. As was noted earlier, such institutions are also active in the provision of agricultural input supplies, in the marketing of farmers' produce and in general extension activity. In recent years, efforts have been made to combine these activities with the provision of credit to form multi-purpose co-operatives, but societies also exist whose main function is the provision of input supplies and extension services.

In Kalasin province, this role has been filled by the Farmers' Clubs run by the Ministry of Agriculture through their provincial and district offices. Initially the clubs (Klum Chaaw Naa) were under the control of the Rice Department of that ministry, but after 1966, they joined the Agricultural Clubs (Klum Kasikam) under the wing of the Agricultural Extension Department. Since then a re-organisation of these clubs has been pending, but little progress has been made in this direction.

In the Lam Pao irrigation project area, most of the societies active under this scheme were the old Farmers' Clubs. Although throughout the province as a whole 176 such groups were active in 1972-73, with 6,505 families holding membership, in the irrigation area their work is much more restricted with only 58 groups active. As can be seen from Table VIII-12 and Figure VIII-6, most of the groups are to be found in Kamalasai district. In Amphur Muang, their

FIGURE VIII-6
LOCATION OF FARMERS GROUP ACTIVITIES

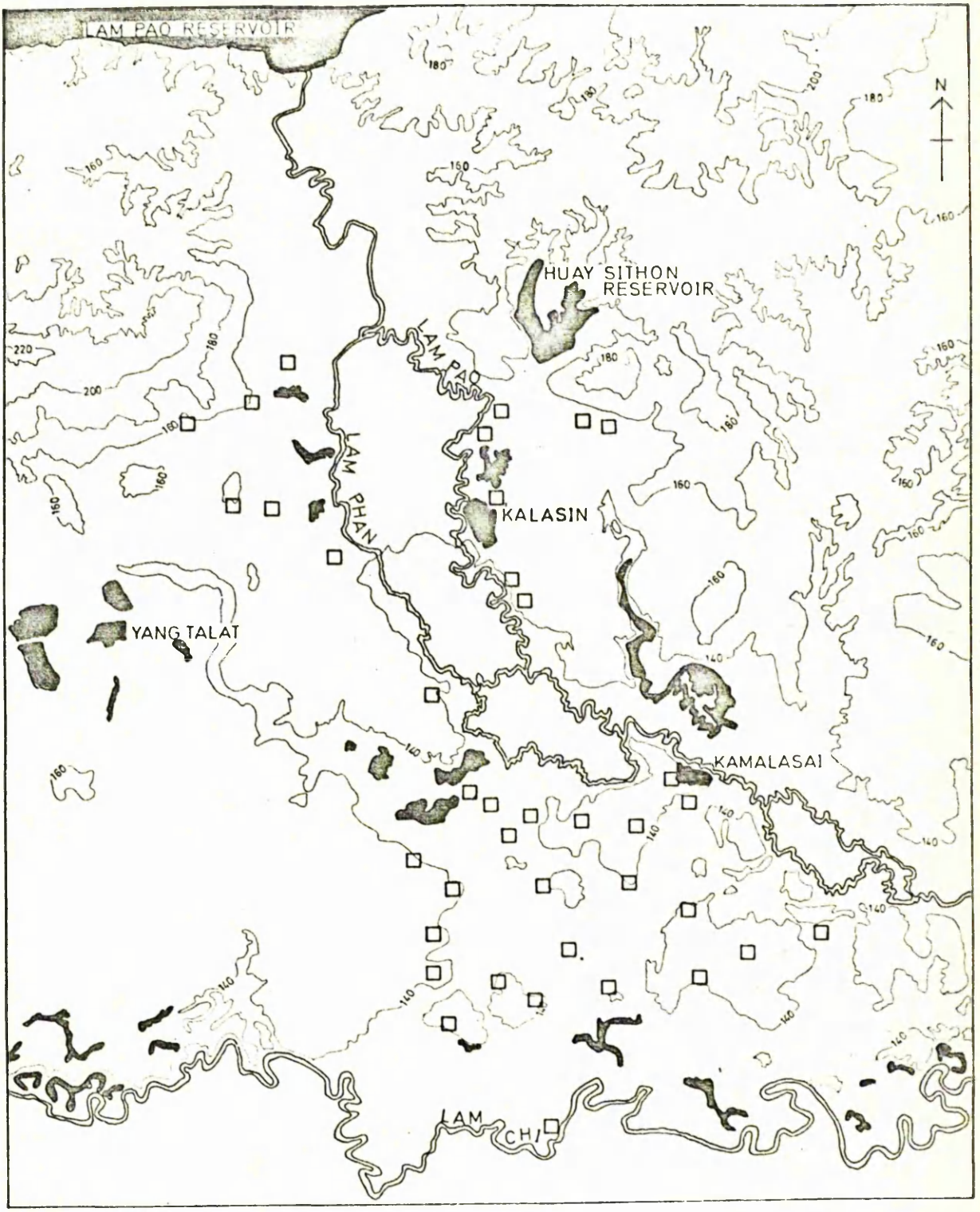

TABLE VIII - 12

Ministry of Agriculture Farmers Groups Kalasin Province

	No. Farmers Groups	No. Members	Area of Holding (Rai)
Amphur Muang	8	339	8158
Yang Talat	8	251	10,995
Kamalasai	42	1622	48,844

activities are strongly concentrated upon the area of the F.A.O. farm at Huay Sithon where their work is closely co-ordinated with that of the resident extension staff. In Yang Talat district, the eight clubs are centred on just two tambols, Um Mao and Bua Ban.

As was noted above, the difficulty of getting to over 10,000 farm families with an extension staff of two in the district agricultural offices means that most extension activity is centred on the villages which (sport) established Farmers' Clubs. It is difficult and indeed impractical to separate the work of the Clubs in some respects from extension activity in general. It is in these villages that new crops are tried out under the district programmes; they too are the exclusive recipients of information about new crops, new techniques and on the local price levels applicable to the central part of the Northeast region. The latter activity means issuing each group leader with a regular fortnightly leaflet with the relevant information appertaining to Khonkaen province as well as notices of useful radio broadcasts to be made in the near future. On the practical side, recent activities have included the supply of soyabean seed, fertilisers and pesticides to the group at Ban Lao in Yang Talat and the experimental planting of the new rapid-maturing upland jute in Ban Tum.[52]

Apart from being the focus of such extension activity on the part of the district agricultural offices, the Farmers' Clubs have offered their services to their members in the

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52. The variety is a Pakistani strain known as 'Daisee' which can be expected to mature in September after April planting.

field of agricultural input supply. Originally the Clubs encouraged farmers to use fertilisers, insecticides and water pumps by purchasing on 100% credit for the members through the district agricultural offices. Farmers were expected to pay within twelve months in much the same way as the short-term loans from the credit societies. The initial response to the scheme was encouraging. Kamalasai district reported total repayments in each of the first three years of operation.[53] However, the viability of the scheme became steadily worse as repayment decreased and the Clubs were unable to secure extra finance. No security was required by the Clubs for farmers to take part in the scheme and the district agricultural officers in Yang Talat noted cases of village leaders absconding with the funds they had collected for repayment.[54]

Thus 1969 was the last year in which the scheme was operated in the old way. As can be seen from Table VIII-13, in that year an extension service generally consisted of supply of fertilisers, insecticide sprays and water pumps. In Kamalasai one farmer was even assisted in buying a tractor. Thereafter, however, the scheme had broken down. In Yang Talat and Muang districts the service had been discontinued altogether. In Kamalasai, with its more extensive cover of Farmer Clubs, a variation has been tried. From 1970 farmers wishing to purchase through the Clubs have had to make an initial 50% deposit with the balance due after harvest later in the year. Farmers have continued to order through

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53. Personal Communication, Khun Wilop, District Agricultural Officer, Kamalasai.

54. Personal Communication, District Agricultural Officer, Yang Talat.

TABLE VIII - 13

Services of Farmers Goups - Kalasin Province, 1969

	Fertilizer (Kgs)	Water Pumps	Sprays	Tractors
Amphur Muang	40,000	10	2	-
Yang Talat	8,000	-	-	-
Kamalasai	122,000	6	10	1

the Clubs have had to make an initial 50% deposit with the balance due after harvest later in the year. Farmers have continued to order through their village leader, but the Clubs have sought supplies from wherever they are cheaply available rather than receiving direct from government sources.

The net result of the new system in Kamalasai has been to reduce the cover of the scheme. Farmers with no cash immediately available are effectively precluded from taking part, so that in 1970 orders for fertiliser dropped to 46.75 tonnes and other supplies totalled 4 water-pumps and 15 insecticide sprayers. In the following year a total of 50 tonnes of fertiliser was ordered. The search for financial viability had clearly restricted the activities of the Farmer Clubs to those farmers in a better financial position.[55]

The Land Co-operatives

The new Land Co-operative organisations of Kalasin province are basically Land Improvement Co-operatives founded to assist the Water Users' Association in agricultural

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55. Finally, by 1975, the promised re-organisation of the 'Klum Kasikam' has been implemented. The Department of Agricultural Extension is now working hand in hand with the Ministry of the Interior in establishing tambol-level societies which are joint-liability groups of farmers with a common enterprise. There is a small circulating budget which can be used by the societies, which can also borrow money from the B.A.A.C. at 9% interest per annum. So far 19 groups have been established in Kalasin province, mainly outside the present irrigated area. Their novelty precludes any assessment of the new system, but the further duplication of services in the region must be noted. The Department of Agricultural Extension continues to assist farmers in the irrigation area in co-operation with the Land Co-operatives, the Irrigation Department and others.

development in the irrigation area. Up to 1969, five land Co-operatives had been established in the province in connection with small tank irrigation projects,[56] but since 1971 larger organisations have been organised for farmers within the Lam Pao scheme. These now number three. The first two in Amphur Muang and Yang Talat were founded in April 1972, that in Kamalasai was formed in August of the same year. Prior to their official incorporation, an extensive period of education activity was carried out in the villages and by June 1971 the membership of the two original co-operatives had grown rapidly to 975 in Yang Talat and 419 in Amphur Muang. Table VIII-14 shows more recent trends in membership and Figure VIII-5 shows the location of societies in Muang and Yang Talat districts.

The Land Co-operatives as established in Kalasin province are multi-purpose co-operative organisations, offering services in credit, agricultural supply and marketing to their farmer members. At the present time, farmer credit and the supply of fertilisers, water pumps and insecticide sprays are the main functions of the societies, but efforts are being made to expend these operations.

In terms of credit supply, the operations of the Land Co-operatives do not differ essentially from those of the A.C.C. societies. Farmers are able to borrow money on either short-term or medium-term bases, with the normal repayment periods, although each of these may be extended according to the nature

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56. National Statistical Office, "Data Book for Changwat Kalasin", Bangkok 1971, draft.

TABLE VIII - 14

Membership Trends in the Land Co-operatives

Kalasin Province

	May 1971	May 1972	May 1973
Yang Talat (Lam Pao)	975	1212	1295
Amphur Muang	419	605	690
Kamalasai	-	268	N.A.

of the investment.[57] The maximum loan, originally 5000 baht, has now been increased to 20,000 baht. In addition the society does allow borrowing on a long-term repayment, with a maximum of 40,000 baht and a repayment period of ten years, extending to fifteen in special circumstances.[58] In all cases the interest rate charged is the standard 12% per annum.

The purposes for which members of the co-operative may borrow money are no less comprehensive than those met above. Short-term loans are allowed for 'necessary household expenses', while both medium-term and long-term loans may be used for the re-financing of old debts.[59] On the other hand, co-operative officials do insist that they attempt to make sure that loans are being used for productive purposes and the societies' regulations call for a careful examination of an applicant's financial position by an appointed representative of the management committee. Such an examination would include enquiries into the farmer's general capital assets, details of how and when he might intend to repay, of family income and expenditure and of any security documents he might hold. The farmer is asked to show how his intended investment fits in with an overall farm management plan and co-operative officials are encouraged to advise farmers on possible development strategies.[60]

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57. Short-term loans are extendable to 15 months, mainly to finance cassava cultivation, and medium-term to five years.

58. These maximum amounts include money still owed from previous loans.

59. Department of Land Co-operatives, "Khor Bang Khap Sahakorn Praphet Karn Borikarn Chanit Camkat, Sahakorn Thii Din Yang Talat Camkat", Bangkok 1970, p.14.

60. Ibid., pp.16-17.

In order to be eligible for a loan of up to 5000 baht, a farmer is expected to provide at least one and preferably two guarantors from among his fellow farmers, one of whom must have land of his own, or deposit a mortgageable land title deed with the co-operative.[61] In practice an applicant will only be loaned an amount equivalent to 60% of the total annual value of his farm produce, in the calculation of which the co-operative takes into account the likely farm price levels at the harvest period.[62] A record of the applicant's maximum credit is filed at the office. For loans over 5000 baht the deposit of the land title deed or a written mortgage on fixed assets to the value of twice the amount to be borrowed is required. In some cases guarantors may also be called for by the co-operative management committee.

Although the policy of the Land Co-operative involves the close supervision of farmer loans, the wide range of purposes for which loans have been authorised means that, in practice, the Land Co-operatives' lending policy has not effectively changed the traditional emphasis in the pattern of farmer borrowing. As can be seen from Table VIII-15, most of the borrowing in the long-term was to repay old debts and in the Yang Talat society this welfare purpose constituted 9.5% of the medium-term loans too. Outside debt re-financing, the bulk of loans was once again channelled to the traditional investments of draught animals and land purchase and for land development. Nevertheless the proportion of

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61. Ibid., pp.18-19.

62. Ibid., p.15. By 1975 a value of 500 baht per rai held was being used.

TABLE VIII - 15

Pattern of Use of Loan - Land Co-operatives - Lam Pao Project Area 1971-3

	1971-2 Short Term (Baht)	1971-2 Medium & Long Term (Baht)	1972-3 Medium Term (Baht)
Amphur Yang Talat			
Pigs and Poultry	8500 (4)	17600 (2)	-
Draught Animals	11200 (1)	246,600 (104)	21,500 (18)
Land Improvement	1500 (1)	276,800 (73)	52,300 (10)
Land Purchase	-	153,800 (44)	28,500 (6)
Debt refinance	-	90,000 (23)	-
	11,200	784,800	102,300
Amphur Muang			
Pigs and Poultry	20,000 (5)	25,000 (2)	-
Hire Labour	5,000 (4)	-	-
Draught Animals	-	131,500 (40)	14,000 (7)
Land Improvement	-	381,000 (96)	20,500 (11)
Land Purchase	-	231,500 (46)	6,000 (3)
Barn Construction	-	13,000 (2)	-
	25,000	812,000	40,500
Amphur Kamalasai			
Draught Animals	-	-	123,000 (27)
Land Improvement	-	-	142,500 (25)
Land Purchase	-	-	17,500 (4)
	-	-	283,000

Figures in brackets indicate number of contracts

money borrowed for the purchase of draught animals is much smaller than was the case with the Agricultural Credit Co-operatives. Here the dominant use is for land purchase and development and while this latter category, as was noted previously, may only represent a continued extension of the area of cultivation, the concentration of the Land Co-operative activities on the irrigated area implies that there may be equally some element of improvement of the irrigable land.

It will be noted that short-term loans only constitute a minor proportion of the total amount borrowed. However, the bulk of the short-term loan credit service is given in kind through the purchase of fertiliser supplies. This is one of the chief functions of the societies. At the beginning of crop season the farmers order the amount of fertiliser they require through their group leader at the village level, from whom the combined orders are transmitted from time to time to the district co-operative office. The society then makes its own contracts for fertiliser supply from the National Co-operative Federation of Thailand, buying in bulk to allow it to sell its supplies to its members at a rate as cheap as any other supplies in the area. Although the smaller societies in Amphur Muang and in Kamalasai are forced to insist on cash sales on account of their relatively limited funds of circulating capital, the larger Yang Talat society has been able virtually from the start to offer its members supplies on credit. Since the credit price is maintained at the same level as the cash price, the Yang Talat Land Co-operative offers a much lower credit price than any other source in the changwat, certainly notably below the 35-40% mark-up noted among village merchants in Chapter VII. In 1972-73, the co-operative was

able to sell on credit at a mere 2.0 baht per kilogramme.[63]

By 1973, wherever the Land Co-operative was fully established, the fertiliser supply service was proving popular; as witnessed in Table VII-10, 14.4% of farmers in the Lam Pao sample survey who used fertiliser were receiving supplies from the Land Co-operative. Overall the extent of the patronage was considerable. In the first full year of operation, a total of 1071 farmers took advantage of the service, purchasing some 251.65 tonnes of fertiliser. As Table VIII-16 shows, in 1972-73 the patronage did decline despite a rise in membership, but nevertheless 552 contracts for supply of fertiliser were made in the two societies of Muang and Kamalasai districts and for all three societies some 212.64 tonnes were supplied to members. The decline in participation may be explained by a certain shortfall in repayments, but in general the record for these short-term loans in kind seems to have been good. Table VIII-17 shows the proportion of loans outstanding at the end of the societies' financial years 1971-72 and 1972-73 and it should be noted in this connection that since most of the fertiliser was supplied in the months of June, July and August, the loans were not due for repayment until these dates.

In addition to the supply of fertiliser, the Land Co-operatives have also purchased a number of water pumps and insecticide sprayers since 1971. These are bought under the same arrangements as for fertiliser except that members are

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63. By 1975, the co-operative price, although it had risen to 6.0 baht per kilogramme continued to be competitive. The co-operative was then buying from the National Federation at 5.6 baht.

TABLE VIII - 16

Supply of Agricultural Inputs

Land Co-operatives

Lam Pao Project Area 1971-3

	Fertilizer (kgs)		Water Pumps (No.)		Insecticide Sprays (No.)	
	1971-2	1972-3	1971-2	1972-3	1971-2	1972-3
Yang Talat	170,300	96,840	)	1	) 1	-
Amphur Muang	58,850	82,800	) 10	7	)	-
Kamalasai	22,500	33,000	-	-		-

TABLE VIII - 17

Repayment Record Land Co-operative Societies - Lam Pao Project Area 1971-3

	Yang Talat (Baht)	Muang Kalasin (Baht)	Kamalasai (Baht)
Amount borrowed to March 72:	772,500	807,000	-
Short-term	11,200	29,000	-
Medium-term	761,300	782,000	-
Amount Repaid during 2515-6:	66,953	99,587	-
Amount Medium-term unpaid	705,547	707,413	-
% " " " "	91.33	87.66	
Amount of money owed on Fertilizer	193,680	117,700	45,000
Amount Repaid	124,271	72,600	61,670
Amount repaid by June 72 (probably of previous year)	38,923	16,900	5,320
Amount repaid by March 73	85,348	55,700	56,350
∴ Unpaid 1972-3	108,332	62,000	-

allowed longer periods in which to repay the larger outlay required for the water pumps where purchased on credit as in Yang Talat. The extent of the service to date is also shown in Table VIII-16.

Although the long-term feasibility of this supply service has yet to be proven, it does seem generally well-received and well-supported by farmers, who welcome the opportunity of obtaining cheap, reliable fertiliser of the correct formula for their particular crops. At present this seems to be the most important service of the Land Co-operative and promises to assist farmer commitment to the society.

Farmer commitment to the society might also be improved by complementing the agricultural supply scheme with a service for the marketing of members' produce and indeed the Land Co-operatives in Kalasin have made attempts to establish marketing agreements with merchants in the area for the sale of rice, kenaf, soyabean and cucumber. In setting up the first series of discussions, in 1971-72, the role of the headman of Ban Na Chuak Nuea, who had himself been second-cropping in soyabean and cucumber was apparently quite important. Unfortunately the prices which the co-operative was asking the local merchants and millers to guarantee were not to the latters' liking. The society wanted 0.7 baht per kilogramme for paddy, 2.0 baht per kilogramme for kenaf, 4.0 baht for soyabean and 30-35 baht per 100 fruit for cucumber. Negotiations floundered and no agreement was made. Had there been a successful contract made for any of these commodities, it is a moot point whether the society could in fact have relied on receiving its members' produce. As the harvest

season prices in 1971-72 turned out, it was possible to obtain at least 0.7 baht per kilogramme for paddy from local merchants on the open market and kenaf prices rose to as high as 2.5 baht. Even where a co-operative has laid down regulations that borrowing members should sell their produce to the society, as in the production credit co-operative for kenaf marketing at Amphur Chatturat in Changwat Chaiyaphum, the society has been unable to guarantee supplies in like circumstances.[64]

It is interesting to note that no further attempt was made to develop a marketing channel through the Land Co-operative until 1974. The Ministry of Agriculture had then taken over the old Ministry of Commerce guaranteed price rice purchase scheme and had restricted its operation to members of co-operatives or farmers' clubs. Co-operative officials and agricultural extension officers visited villages to inform farmers of the scheme and the farmers were expected to deliver the rice themselves to a depot in front of the provincial offices.

In 1975 the whole system had passed directly to the constituent co-operatives and both the Land Co-operatives in Yang Talat and Amphur Muang were about to construct a store in which to keep their purchases. In Yang Talat it was the intention to supply bags and transport to members selling to the co-operative, but the committee had still to decide whether members would have to pay for these. Nor had they made arrangements for the onward sale, although the Amphur Muang

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64. Agarwal,M.C., "Co-operative Marketing of Kenaf in Thailand - A Case for Vertical Integration", Bangkok 1971, pp.50-51.

society had concluded an agreement with a Khonkaen rice mill. The whole scheme was seeking to challenge the monopoly of the local middlemen.

In essence this scheme seems only to be a development of the former price guarantee schemes instituted in 1964 and again in 1970 to offset drops in the rice price. These were no great success and the co-operatives' plans seem likely to suffer from the same disadvantages, including the necessity of farmers transferring their own rice to central buying points, the problem of provision of sacks and possible delays in payment until the co-operative disposes of the rice.[65]

The attempt to establish marketing channels for members' produce may be seen as an important innovation in the work of the co-operatives in the Kalasin area. What is curious is that the Land Co-operative should attempt to enter the field of paddy marketing rather than finding outlets for new and experimental crops in the area like peanuts, soyabeans and vegetables for which marketing problems have already been noted. Government organisation has already been active in marketing soyabean in the area of the Huay Sithon farm under a Thai-Japanese agreement conducted through their respective co-operative federations, but this was a temporary agreement. It seems clear that a good deal of further thought is needed for the successful operation of a marketing service. It is difficult to give a guaranteed price where there is competition from merchants and without the assurance of a better price than available elsewhere the farmers' commitment to the co-operative can scarcely be expected.

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65. Dixon, C.J., "Markets, Marketing and Agricultural Change in Northeast Thailand", I.B.G. Developing Areas Study Group Conference Paper, London 1974, pp.23-24.

The Success of Farmers' Associations at the Farm Level: The Evidence of the Lam Pao Sample Survey

Consideration of the work of the farmers' associations in Kalasin province so far has been set in the context of the whole changwat. In order to assess their effectiveness in assisting the transition from rain-fed subsistence agriculture toward more diversified, commercialised irrigated cropping, the response of the farmers in the Lam Pao sample survey to the services offered by the co-operatives will now be considered. In the preceding section, a number of suggestions were made to the effect that the farmer associations did not reach a large number of farmers, that farmers were often ignorant of their functions, that those farmers who were members were critical of the working of the organisations and that the credit services in particular did not lead to increases in productivity. These assertions will be further examined below.

In the 1970-71 crop season, the Lam Pao sample survey revealed that 19% of farmers were members of one or other of the co-operative organisations. Of these 4.6% were members of just the Water Users' Associations and as such were unable to take advantage of credit facilities and other services. As Table VIII-18 demonstrates, however, some were members of both the Water Users' Association and one of the credit societies. It is also apparent that, with the exception of the W.U.A., no single society reached more than 5% of the farmers in the sample. Indeed, although it has been suggested that the activities of many of the societies duplicate and overlap one another, it seems to be the case that, in spatial

TABLE VIII - 18

Membership Trends in Co-operative Societies

Lam Pao Sample Survey 1970-1, 1971-2, 1972-3

	1970-1		1971-2		1972-3	
	No. Members	% Total Sample	No. Members	% Total Sample	No. Members	% Total Sample
Agricultural Credit Co-operative	12	5.0	10	4.1	8	2.8
Land Co-operative	2	0.8	16	6.6	23	8.1
B.A.A.C.	10	4.2	22	9.1	15	5.3
Farmers Group (Min Ag)	11	4.6	7	2.9	11	3.9
Water Users Association	15	6.3	28	11.5	29	10.2
Thai Farmers Bank	-	-	-	-	3	1.1
All Groups	50*	19.3	83**	25.9	89***	

* Four farmers are members of more than one group. In addition there was one member of a Postman's Co-op.

** Twenty farmers were members of more than one group. There were in addition five farmers who were members of associations of no agricultural importance, such as the Teachers Co-operative, Life Assurance Society etc.

*** + 11 members of non-agricultural co-operatives, mainly the Teacher's Co-operative (10 of these holding no other membership) 15 families were members of more than one association).

terms, the activities of the various organisations are complementary; that is, each group seems to be fulfilling the same function in a different village. (Tables VIII-3 and VIII-18).

The sample survey in the following year, 1971-72, recorded a slight increase in the proportion of co-operative members among farmers interviewed. 25.9% were then members, of whom 5% belonged only to the Water Users' Association. Once again a number of farmers were members of both this and one of the credit societies, usually the B.A.A.C. Farmers' Groups or the Land Co-operative. The increase in membership in the preceding year had taken place almost exclusively in these associations, all of more recent foundation. Thus while membership of the Agricultural Credit Co-operatives and the Farmers' Clubs of the Ministry of Agriculture has remained stationary or declined, the newer Land Co-operative and the Bank groups have prospered. (Table VIII-18).

With 20 families members of more than one association in 1971-72, the 63 farm families holding co-operative membership were concentrated in those villages where co-operative extension activity had been most strongly directed. Thus in Ban Na Chuak Nuea, which has been receiving irrigation water since 1969, 43.2% of the farmers interviewed were members of the Water Users' Association while, following the recent extension activity in Ban Fai Taek, all six members belonged to that organisation, constituting 26.1% of the village sample. A similar differential effect had been experienced with regard to the Land Co-operative. Of the 16 members, all

but one were in Yang Talat district, where the association had been most active. Again most members were to be found in Ban Na Chuak Nuea, where the headman was a member of the Land Co-operative's management committee. By 1973 membership was also growing rapidly in Ban Tum. By contrast the southern villages, not scheduled to receive irrigation water for some time, have been neglected in the efforts of the co-operative officers. Here the Land Co-operative has developed more slowly and most farmers are members of the older organisations, although the foundation of the Joint Liability Group of the Thai Farmers' Bank in Ban Lao Yai in April 1972 should be noted. Its presence is reflected in the figures for 1972-73 in Table VIII-18 and village membership levels are shown in Table VIII-19.

The figures from the Lam Pao sample survey seem to suggest a steady increase in farmer membership of co-operative organisations. More important, however, is an assessment of the extent to which farmers are actively participating in the services offered by the co-operatives. Although a number of farmers had bought water pumps and insecticide sprayers up to crop season 1972-73, it was not clear whether these had been obtained from the co-operatives. In 1972-73, however, as was noted in a previous chapter, it had become apparent that the Land Co-operative in Yang Talat at least had become a regular source of fertiliser supply for some 14.4 percent of a sample group of farmers.[66]

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66. See Above, Chapter VII.

TABLE VIII - 19

Membership Trends in Co-operative Societies

By Village - Lam Pao Sample Survey 1970-1 & 1971-2

Village	1971 No. Members	%	1972 No. Members	%
Ban Na Chuak Nuea	10	28.57	19	51.35
Ban Tum	9	15.79	12	20.00
Ban Um Mao	15	42.87	14	43.75
Ban Fai Taek	2	8.00	6	26.09
Ban Lek	4	9.52	6	14.29
Ban Non Sung	3	9.09	4	10.81
Ban Lao Yai	3	27.27	2	16.67
Total	46	19.33	63	25.93

For most farmers, however, the co-operative societies in Kalasin province constitute only a source of cheap credit and their participation is best assessed on this basis. Just as there has been an increase in the number of farmers who are co-operative members over the last couple of years, so too has there been an increase in the numbers borrowing and the amount of money borrowed. In 1970-71, 19 farmers used the co-operatives to obtain credit, representing 41.3% of the membership, but only 8.0% of the total Lam Pao sample survey. By 1971-72, 31 farmers had borrowed money, 49.2% of the co-operative membership and 12.8% of the total sample.[67] Moreover, the amount of money borrowed had increased substantially. In 1970-71, the 19 farmers borrowed 52,100 baht from the various societies, with an average loan of 2,742 baht per borrower. This was already a total exceeding the amount of non-institutional borrowing during that year, but it was small compared to the total for 1971-72. In that year the 31 borrowers received loans totalling 98,890 baht, averaging 3190 baht per borrower.[67]

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67. Season 1972-73 saw a further rise in participation. Borrowing from all co-operatives was 195,200 baht (154,500 from farm co-operatives) with 59% of members borrowing in each case. The average loan rose to 3983 baht from all sources and 3,554 from farmer co-operatives alone.

On this basis then, it would appear that the co-operative organisations in the Lam Pao irrigation project area were beginning to achieve some degree of success in reaching the farmers. It appears that farmers were becoming more willing to borrow money from such institutions and, despite the criticisms of their services noted above, an enquiry about the attitude of farmers to interest rates revealed that the low co-operative rates were impressing themselves on farmers' minds. Those interviewed were asked if they thought that interest rates from the various loan sources were expensive or not; Table VIII-20 presents their reaction. As may be seen, rates for the co-operatives and the commercial banks were recognised to be much more favourable than those charged by merchants and neighbours.

The only unfavourable aspect expressed by Table VIII-20 is the fact that a high proportion of farmers were still ignorant of the current rate of interest being charged by the institutions. The proportions recorded for the co-operatives and banks are not noticeably higher than those for non-institutional sources, but the latter, at least for relatives and neighbours, contain a certain percentage of farmers who said that they were never charged interest from these sources. From the point of view of the institutions, it may be noted that nearly half of the farmers were still ignorant of their services or were suspicious about borrowing even if it might help to increase their standard of living.

The attitude that use of credit is a dangerous thing except between relatives and in household emergency is clearly one which still affects a number of farmers in the study area. Even farmer leaders are worried about the consequences of

TABLE VIII - 20

Reaction to Rates of Interest by Source

Lam Pao Sample Survey 1971-2

Source	Expensive	Not-Expensive	Don't Know/ Never Borrow
Co-operatives	20.2	52.3	27.6
Banks	17.3	51.4	31.3
Merchants	49.4	21.8	28.8
Neighbours	56.0	18.9	25.1
Relatives	28.0	38.7	33.3

borrowing large sums of money. The now-retired village headman in Ban Tum put forward his attitude one afternoon. He saw himself as being paternalistically responsible for the welfare of the people in his village and was unwilling to support any development in his village which might be harmful. He argued that the establishment of a credit co-operative within the village would encourage farmers to borrow when their annual farm production was still at risk from the unreliable weather and might well lead them into heavy debt. He was therefore unwilling to encourage such an organisation until the irrigation system, which he regarded as offering a degree of security to production, had reached the village and was functioning smoothly. It was not that the headman was against farmers' associations as such; he was in fact the head of the village Farmers' Club. He was against the foundation of a credit co-operative. At that time (1971), although Ban Tum was one of the largest villages in the area, it did not support an Agricultural Credit Co-operative.[68]

The attitude of the old headman at Ban Tum indicates that the co-operatives do have problems in getting across to farmers. This is not helped by the large number of organisations at work in the area. As was noted above, farmers are often confused by the variety of visits they receive from the officials of the different organisations. In order to assess the extent of farmers' confusion, misunderstanding or ignorance, a small sample of farmers was asked how they thought

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68. With the retirement of the old headman and the election of the young 'kamnan', co-operatives received much more encouragement. As irrigation water arrived the old 'puyaiban' actually joined the Land Co-operative.

the co-operative organisations might be able to help them. Their answers are sufficient to show that the general conception of the function of co-operative organisations was at best vague and at worst grossly mistaken.

Of those interviewed, 27% were completely ignorant of the possible value of the co-operative, whereas 8% went to the other extreme of thinking that such associations might be the answer to all their problems. Another 8% reflected the views of the headman at Ban Tum in being suspicious of joining a co-operative for fear that they would have difficulty in repaying any loan they made. 19% of the farmers felt that a co-operative could only help them by offering a cheap source of credit, which at the time of the survey, prior to the foundation of the Land Co-operative, might be taken as an essentially correct viewpoint. On the other hand others were largely confused. One farmer in Ban Um Mao had just joined the Land Co-operative which he expected to help him with better supply and control of irrigation water; by contrast a young farmer in Ban Na Chuak Nuea was convinced that membership of the Water Users' Association would help him obtain cheaper credit, new seeds and a better price for his crops. In that the two organisations are designed to work in parallel, perhaps such confusion is understandable, but both farmers did not seem to realise that they had to be members of both organisations to take advantage of their respective facilities.

Despite the growth in membership then, there does remain a large degree of suspicion and confusion among farmers in their understanding of the work of co-operatives in the Lam Pao irrigation project area. Nor does it appear that

the encouraging increase in the willingness of farmers to borrow is matched by a growing use of funds for other than the traditional investments. The returns from the Lam Pao sample survey correspond closely to the pattern of use of loans already noted of the credit societies at the district level. Using the more detailed breakdown of use of loans obtained for crop season 1971-72, the 31 borrowers in that year listed some 62 uses of the loans which are summarised in Table VIII-21. From the Table it may be noted that uses of credit for non-productive, non-agricultural purposes accounts for a significant proportion of the total responses given, with house construction, medical expenses and household consumption expenditure making up 21.1% of the total number of stated uses. More interesting is that over one-fifth of the borrowers used at least part of their loan for direct consumption expenditure, a category not actually recorded in the official co-operative figures. This bears out the suggestion of the FAO that

> "..the small farmer always finds ways and means to divert loans to consumption." 69

Moreover, confirming the pattern of the district level returns, the purchase of work animals is the most important single use, with over half the borrowers using some of their loan to this end.

It was impossible in most cases to find out from farmers the exact amounts spent within each category when more than one use for the loan was stated. It is possible to divide the sum borrowed equally into each category supplied,

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69. Food and Agriculture Organisation, "Agricultural Credit from Co-operatives and Other Institutions", Rome 1965, p.46.

TABLE VIII - 21

Co-operative Borrowing: Purpose of Loan - Lam Pao Sample Survey 1971-2

Purpose	No. Borrowers	% Borrowers	% Total Purpose
Buy Land	3	9.7	4.8
Hire Labour	7	22.6	11.3
Draught Animals	16	51.6	25.8
Buy Seed, Fertilizer	9	29.0	14.5
Hire Tractor	1	3.2	1.6
Buy Agric. Implements	4	12.9	6.5
Home Construction	4	12.9	6.5
Land Development	6	19.4	9.7
Medical	2	6.5	3.3
Consumption	7	22.6	11.3
Others	3	9.7	4.8
	62	*	100.0

* Most borrowers expressed more than one purpose; this column therefore does not add up to 100.0%

but this, while reducing the proportion expended on consumption, only confirms the pattern already described. (Table VIII-21). What the whole pattern does suggest is that each loan has secondary uses alongside those given in the co-operative societies' records. These, while including a greater element of consumption borrowing, also include a higher proportion of use for modern, productive purposes. For example, 29% of farmers used funds to buy fertilisers, 23% hired labour and 19% invested in land development.

Evidence from the Lam Pao sample survey tends, generally, to confirm the suggestions made earlier that the loans made by the co-operative societies in Kalasin province are not fully effective in improving agricultural productivity. It confirms too that, despite the large number of different societies at work in the province, or perhaps because of this, farmers are still suspicious and confused concerning the operations of the associations. The co-operative societies are continuing to fail to reach a large number of farmers who might have need of their services and only a minority can be said to really benefit from their work. It has been suggested above that, because of the regulations involved in making loans or the care farmers in joint liability societies must take in selecting their comrades, only the better-off farmers would be able to make active use of co-operative facilities. In order to confirm or deny this suggestion, the social and economic characteristics of households holding co-operative membership were compared with those who were non-members. A number of statistical tests were carried out on the null hypothesis that there was no difference between the groups. The results are presented below and in Table VIII-22.

TABLE VIII - 22

Co-operative Members and Non-Members - Economic Contrasts - Lam Pao Sample Survey 1970-71

Variable	Mean Value Members	Mean Value Non-Members	T-Value	Significance Level
Value of Rice Crop	2276.9	1694.8	3.64	99.9
Total Crop Value	3924.3	2633.3	3.83	99.9
Area Planted in Rice	17.0	12.2	3.06	99.0
Total Holding	23.3	16.5	3.27	99.0
% Rice Sold	12.5	5.5	2.43	98.0
Size of Kenaf Holding	4.3	2.7	1.84	90.0
Mean Input on Rice	270.7	182.4	1.64	90.0
Income from Kenaf	1299.9	821.0	1.79	90.0
Mean Input on Kenaf (per Rai)	10.0	2.8	1.81	90.0

An initial X^2- Test compared the incidence of values above and below the overall sample mean for a number of variables for the two groups of farmers. This at once pointed to significant differences between the groups in relation to size of holding, average income deriving from crops and mean total income. All of these were significant at the 99.9% confidence level. Of a similar order, significant at the 99.5% level, were the differences in average size of household and the average amount of fertiliser being used. Less significant, but still at the 95% level, was the difference in the average income from non-agricultural sources.

A more detailed investigation was then conducted using a Student's T-test on a series of variables relating to the farm household economy relating to both the major crops, rice and kenaf. Again the analysis pointed to strong differences between the two groups of households. As Table VIII-22 shows, the co-operative members had received a much higher return on crops than had non-members, they had much larger holdings, particularly of paddy land and they were more commercially inclined in terms of the average amount of rice sold. At a lower level of significance, co-operative members also had substantially larger kenaf holdings and higher returns from that crop too.

The evidence of these tests of significance leads one to the conclusion that the null hypothesis of no difference between the groups must be rejected. It is clear that, as was suggested on the basis of the co-operative membership and borrowing regulations, the co-operative members are indeed, as a group, the richer farmers with the larger holdings. In selling a higher proportion of their rice, in having larger

plots of kenaf and in investing more heavily in fertilisers, the co-operative members appear also to include many of the more commercially-oriented members of the community, already looking for investment opportunities in agriculture. Already capable of financing their own enterprises to a certain degree, they are using membership of the co-operative to assist them to expand those enterprises. It may be argued that it is the result of their co-operative membership which has enabled them to increase their productive capacity through the purchase of more land, but few have been members for more than two years and none have been recorded increasing their holding in the time of their membership, though some have plans to do so. It is rather that their superior original position has made them willing to risk borrowing for further investment. By contrast, although there are obviously within the group of non-members some farmers of similar type who feel no need of co-operative assistance, there are many with smaller holdings, unable to finance new enterprises, who are either ignorant of the work of the societies or who find their regulations for membership or for use of facilities difficult to comply with. By failing to reach these people the co-operatives may be said to have been, to date, failing in their objective of generating agricultural growth.

The above discussion has suggested the existence of a number of important problems facing the farmers' associations in Kalasin province. All the societies face the fundamental problem of reaching the mass of small farmers without endangering their viability of operation. Where loans or services are given with little restriction on the type of borrower or on the use to which the loan is put, there is a danger of heavy

repayment defaults. Where regulations are strictly enforced or groups carefully organised to include only the better security risks, then the position of the mass of farmers is not improved. Thus far the evidence presented above suggests that the societies at work in Kalasin province have not found a happy medium between these two extremes.

Nor have lending policies been clearly adjusted to the needs of development. Most societies continue to give loans for repayment within three years, medium-term loans which continue to be used as circulating capital in traditional investments like draught animal purchase. The issue of credit on a short-term basis for productive purposes would seem likely to be a more secure form of lending than that for periods longer than twelve months. On the other hand this cannot be an exclusive rule for it is quite possible that a farmer may need longer-term credit to bring to fruition a whole new investment programme. In fact, one of the difficulties of the credit societies is that, whatever the system of security guarantees, they are ignorant of a farmer's overall intentions and his credit needs. By contrast a farmer introduced to new methods of cultivation by the work of the Farmers' Clubs or extension officers may find that he cannot get the capital or the cheap input supplies necessary to carry out his plans. In aiming at some degree of supervision of their loans, the Thai Farmers' Bank and the B.A.A.C. have sought to improve the situation, but the problem of co-ordination still remains.

It has been suggested that, in order to make the provision of extension services more effective in rural Thailand, there should be an amalgamation of the existing societies or that multi-purpose co-operatives should be established in their place.

These societies have been planned to incorporate services for credit, input supply, extension information and even marketing of farm produce in a single association so that these facilities can be co-ordinated in an overall farm management plan. Such has been the purpose of the foundation of the Land Co-operatives in Kalasin province and their proposed amalgamation with the Agricultural Credit Co-operatives. Indeed the foundation of the Land Co-operatives promises to improve the performance of the farmers' associations in the area. The Land Co-operatives are attempting to co-ordinate the provision of credit with the other needs of the farm population in securing cheap, reliable farm inputs and reliable marketing outlets. They are striving through careful supervision of loan requests, like the Bank for Agriculture and Agricultural Co-operatives, to ensure that credit is used for the maximum productive purposes. They have established a well-supported service in agricultural supplies and are trying to widen its scope.

The problems of the Land Co-operatives indicate, however, just how difficult is the task of building a viable, but useful, farmers' association. It is clear that, in general, farmers welcome both the provision of cheap credit and of reliable fertiliser supply, but they are nevertheless critical of the service currently being offered. Obtaining fertiliser continues to involve considerable red tape. Fertiliser supplies are not immediately available at the co-operative office, each farmer sending an order which is first bulked and then sent to the Co-operatives Federation. The supplies are then sent back to Kalasin as and when they are available, which frequently means a delay of up to a fortnight. Such delays are clearly crucial where fertiliser application is closely co-ordinated

with the arrival of irrigation water, but without storage facilities the co-operative is in no position to have large supplies of raw materials available on the spot.[70]

Similar criticisms are voiced concerning the delays in transmission of credit. The Land Co-operative desire to relate size of loan given to the general credit standing of the individual farmer makes the process even more painstaking than is usual. It means naturally that co-operative credit is not as conveniently obtained as that from non-institutional sources. The examination of each loan application awaits the fortnightly meeting of the co-operative committee, so that a farmer may have to wait that period of time for the approval of his loan. He has got to submit a detailed written application along with his guarantee and this often causes difficulty for the less literate, who often have to outlay money to have a neighbour or the village headman write their application for them.

Farmers complain about such delays and costs, but more serious to them is the shortage of funds available from the co-operatives, especially as price inflation forces the cost of the various farm inputs higher. This has recently apparently resulted in many farmers receiving only 70-80% of the amount of loan they have requested, a shortfall which effectively prevents them from carrying out the plan for which they required the money. In this connection one may quote a meeting between local farmer leaders and extension officials at the Huay Sithon farm:

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70. In June 1975 construction of a storage shed was begun by the Land Co-operative in Yang Talat, but this was for storage of rice bought from members rather than fertiliser supplies. See above.

President: "Actually, if you are short of funds you should borrow from the Co-operative or the Bank for Agriculture and Agricultural Co-operatives or the Farmers' Clubs. Most of you are members already and if you're not you should join so that you are able to borrow."

Farmer Leader: "The credit offered by the co-operative is too little. Suppose we get 5000 baht to buy a buffalo, then that's all we can do - there's nothing left to buy fertiliser, seed and insecticide." 71

Such delays and shortages must be solved if farmers' confidence in the co-operative organisations is not to be undermined. The problem of temporary delay in supplies should be capable of solution through the provision of storage facilities. General shortage of capital is a more intractable problem. It depends on more funds being made available to the co-operative movement by the government. As it is at present, moreover, such funds as are available are tending still to go to the richer farmers. Loan regulations, even under the less strict regulations enforced by the Land Co-operatives, tend to favour those with the greater resources at their disposal. For many farmers productive use of the new facilities of irrigation water requires the co-ordination of adequate and reliable external services of cheap credit, supply and marketing with the irrigation water and with the other factors of production on the farm. A failure in this area affects the success of the whole development effort. Much still needs to be done to ensure that success in the work of the farmer associations in the Lam Pao area.

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71. Minutes of Agricultural Extension Meeting No.4/2518, Lam Pao Project, Huay Sithon, 3rd June 1975. Author's Translation.

CHAPTER IX

PROBLEMS AND PROSPECTS

In its plans for the development of the backward Northeast region, the Thai government has laid considerable stress on the need for the development of water resources. This has been deemed an essential in the process of transforming the traditional rain-fed subsistence agriculture of the region into a more modern commercialised economy capable of forming the basis of an improved standard of living for the population. The importance of the physical geography of the Northeast region in holding back its progress has been realised and the construction of dams for flood control and of irrigation projects has been intended to help overcome these significant physical deficiencies.

In planning the many irrigation projects in the region, the Thai government has been realistic in believing that the development of irrigated, diversified agriculture requires more than the provision of the physical facilities of dams and irrigation canals. It has sought to prepare farmers for the new opportunities by the establishment of extension services, particularly through the auspices of farmers' associations administered by the Department of Co-operative Extension and the Royal Irrigation Department. It would appear, however, that these schemes have been less than successful. It may be admitted that extension efforts have been badly timed, a problem made more difficult by the budgetry problems of the government departments involved, but perhaps more important may be a severe underestimation of the

true difficulty of the problem.

The provision of an irrigation system, by its very nature a highly immobile asset, offers opportunity only to a selected group of farmers whose land lies within the irrigible area. This in itself offers problems to the regional planner in that he must take note of the possible consequences of the provision of this facility on the surrounding area. Plans for the irrigation area may be disturbed or disrupted by migrations from surrounding upland villages and funds will have to be channelled into such areas to prevent a complete loss of equilibrium. Even within the irrigible area, the provision of the irrigation facilities may interfere with the balance of the traditional economic structure. A new irrigation system makes demands on the individual farmer to re-organise his existing resource base, demands which can be met more easily by some farmers than others. The differential response among farmers to the innovation can have a strongly inegalitarian effect within the community. Such a tendency is wholly unacceptable in the context of the generally egalitarian philosophy of development planning followed, at least nominally, in even the most autocratic and elitist regimes in the Third World.

Although the government of Thailand since the overthrow of the absolute monarchy in 1932 has generally followed much the same principles of autocratic rule, with even the present democratically-elected government following only mildly socialist policies, the general problem of development of irrigation resources outlined above is of considerable concern. The success of such irrigation projects is important to the country,

not only to generate growth in the economy of the Northeast region, but also to guard against any more serious political insurrection in that area. Thus, if the irrigation projects are only able to benefit a certain proportion of the population within their boundaries, it may be that, as schemes which require considerable co-operation between farmers for their successful implementation, they will yield only an insignificant return on the heavy investment made in them. In addition, their performance will almost certainly affect the government's attitude to the more far-reaching developments which have been suggested for the development of the water resources of the immense potential which lie in the Mekong River.

The present study of irrigation projects in Northeast Thailand, particularly of the Lam Pao irrigation area in Kalasin province, has sought to examine the possible problems of irrigation development in this context. It seemed clear that the mere fact of changing economic circumstances in the Northeast region, with increased pressure of population on land and increased aspirations on the part of farmers would not of themselves bring about the widespread adoption of irrigated agriculture. The Northeast farmer still has the option of migration to urban areas and cultivation on a short-term basis of upland areas for cash crops, both albeit increasingly unwelcome trends, to satisfy these needs. Nor should it be expected that the adoption of more favourable pricing policies by the government will necessarily give farmers the incentive to adopt irrigated agriculture. Even the removal of the rice premium has been shown to have little effect on the price of the glutinous rice mainly produced in the Northeast. The problems of development of irrigated

agriculture are deeper than this.

It was felt that, if the new irrigation system required too much of farmers in terms of re-organisation of existing resources and of mobilisation of new resources, then it would be probable that the success of the scheme as a whole might be jeopardised. It was felt that, as changes of this nature frequently require increased capital inputs on the part of the farmers, it might be those with more capital, the larger, richer farmers who would benefit most from the irrigation facilities. To examine this contention, the traditional patterns of organisation of land, labour and capital inputs in the agricultural system were assessed, along with a consideration of the channels by which a farmer might obtain supplies and dispose of his output. Evidence from these investigations has indicated a number of interesting developments which may be summarised here. First, however, it is necessary to examine briefly such evidence as is available of a quantitative nature on the trends in income levels under the impact of irrigation development.

Clearly if the development of irrigation facilities in Northeast Thailand were such that it favoured the better-off farmers, it might be expected that this advantage would be reflected in the income levels of the various farm families. Thus the income of the wealthier would be growing more rapidly than that of the less well-off.

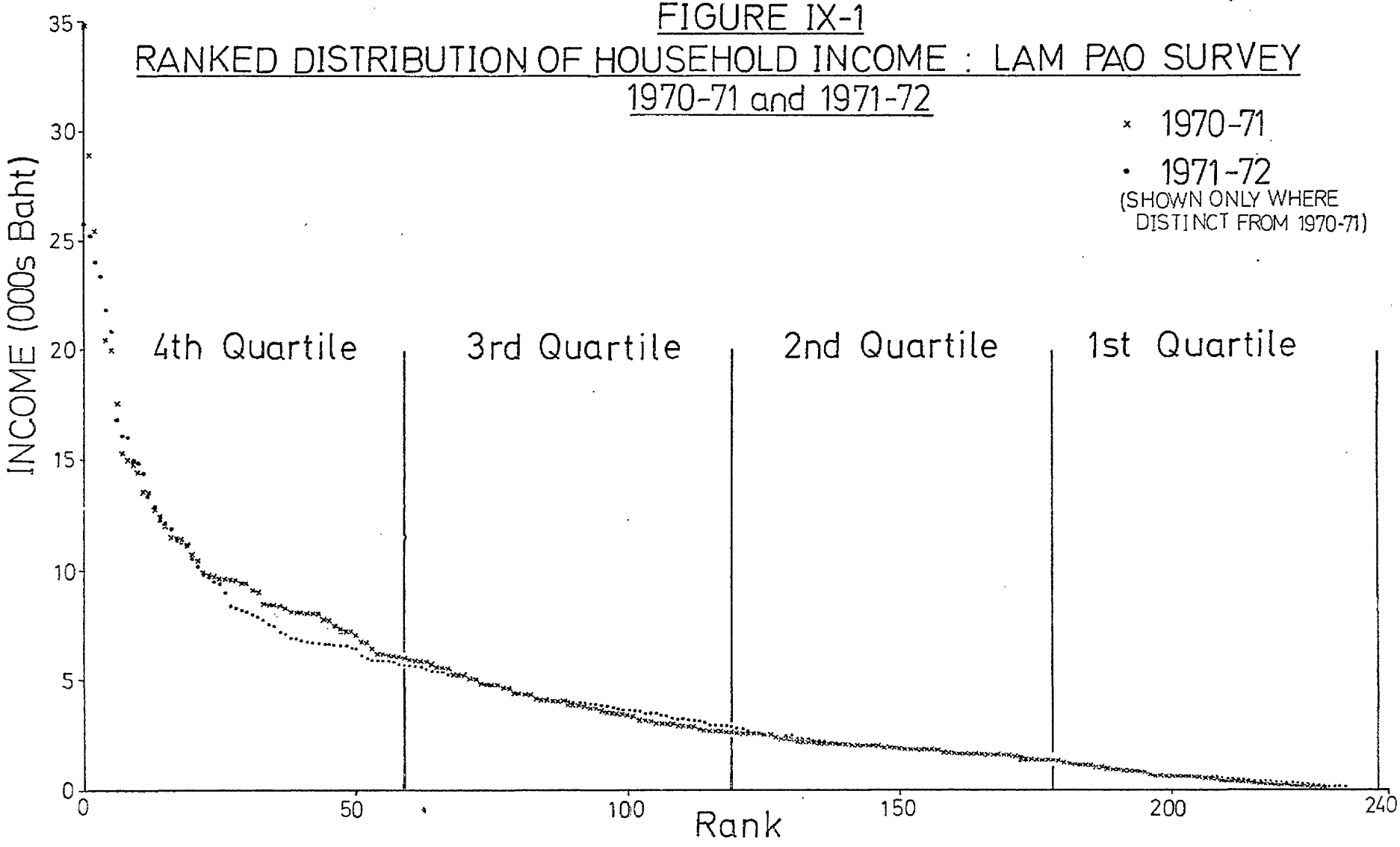
Unfortunately the data so far available from the Lam Pao survey investigations tend to preclude a detailed analysis of this problem. It was noted above that the failure of the construction works to maintain schedule has meant that the irrigation water has been slow to reach the villages chosen in the

sample survey. By 1972-73 only two of the villages selected had received supplies, one for only one year in the wet season. In such circumstances it is scarcely possible to attribute any of the changes in income levels to the effects of irrigation.

Moreover detailed data is only so far available for the first two years of the intended five years of the Lam Pao survey. This is a very short period in which to assess changes in income levels and, for any analysis to be made, the two years have to be set in context. The crop season 1970-71 represented the bottom of a steep decline in the price of the staple food crop, also frequently the main cash crop, rice. In that year the average price recorded in the area was 0.51 baht per kilogramme, compared to 0.62 baht per kilogramme in the following season. In the case of the main cash crop for some 60% of the farmers in the Lam Pao survey, kenaf fibre, the price also rose from the 1970-71 level of 2.05 baht per kilogramme to a mean of 2.14 baht per kilogramme in 1971-72. Such price differences must be taken into account in any analysis of income levels.

A second point of difference between the two years of study concerned the off-farm component in the total income levels. In the first year of survey the level of income from off-farm sources per farm family was greatly in excess of that recorded for the second year. This was a reflection of an apparent cut-back in government spending on construction and similar projects during the second year's operation, particularly associated with the amount of employment available in connection with the irrigation project itself and with road construction. Unlike the case of crop prices, it is difficult to make any quantitative

FIGURE IX-1
RANKED DISTRIBUTION OF HOUSEHOLD INCOME : LAM PAO SURVEY
1970-71 and 1971-72



assessment of the effect of this change on total income levels in the two years.

Any examination of the comparative income statistics for the first two years of the Lam Pao sample survey amply illustrates these problems. Initially it was decided to divide the households within the sample into four quartile groups according to total cash income levels (Figure IX-1) and the average income for each group was calculated for the successive years. This showed, rather surprisingly, that the income of the poorer farmers had actually increased between 1970-71 and 1971-72 by as much as 15.6%, while that for the succeeding groups had increased at a lower rate until for the highest quartile group there had been a substantial fall of some 8.8% over the two years. (Table IX-1).

To assess the significance of these figures, the composition of the income of the four quartile groups was examined. It was noted that for the four groups there was an inverse relationship between the dependence on income from crops and total income. It was, therefore, possible that the relative differences in income levels might have some connection with changes in crop prices between the two years and for this reason the crop income element was isolated.

Here a different picture emerged. Although the lowest quartile group showed a 45.9% increase in income from crops, all groups also showed an increase, as much as 30.2% in the highest quartile. Moreover in real terms the crop income of the third and fourth quartiles, with increases of 248.6 baht and 550.7 baht respectively, had risen substantially more than the first and second quartiles. Removing the influence of price increases by reassessing income levels for 1971-72 on the

TABLE IX - 1

Income Levels Quartile Groups

Lam Pao Survey 1970-71 & 1971-2 (Current Prices)

Group	Mean Total Income 1970-71	Mean Total Income 1971-72	Change 1970-71 -1971-72	% Change
	(Baht)	(Baht)	(Baht)	
1st Quartile	481.65	556.69	+ 75.04	+ 15.58
2nd Quartile	1947.10	1976.92	+ 29.82	+ 1.53
3rd Quartile	4077.66	4091.70	+ 14.04	+ 0.34
4th Quartile	11179.04	10194.03	-905.01	- 8.81

basis of the average prices obtained in 1970-71, there was another minor alteration in the pattern. The increase achieved by the lowest quartile group held up best and even on this basis there was an increase of 37.6% over the two years. As total income increased, so the extent of change widened. The second quartile showed a decrease and the increase of the third quartile was substantially below that of the first. The upper quartile group, however, with an average increase of 242.3 baht, were still undoubtedly improving their position in agriculture more than any other group. (Table IX-2).

Clearly the reduction in the income levels of the upper quartile group between 1970-71 and 1971-72 is a function not of the reduction in agricultural production, but rather of other sources of income, notably of off-farm income. The reduction in the level of off-farm earnings noted above affected this group much more than the other three quartile groups. In addition the presence of an extremely rich family with large amounts of remittance income, totalling up to 54,000 baht, in the 1970-71 sample also had a highly distorting effect. The removal of this case leaves an average reduction in the total earnings of members of the upper quartile group of only 244.7 baht between 1970-71 and 1971-72; this is more than accounted for by the massive decline of 1468.7 baht in off-farm earnings. (Table IX-3).

It may be argued then that since it is clearly off-farm income which tends to produce the greatest variations in income among the upper quartile group, if this element were to be removed from the consideration, a rather clearer picture of income movement from mainly farm-based sources would be obtained. When this operation is carried out the upper quartile

TABLE IX - 2

Crop Income Levels: Quartile Groups
Lam Pao Survey 1970-71 & 1971-72

Group	Current Prices				Constant 1970-71 Price		
	Mean Crop Income 1970-71 (Baht)	Mean Crop Income 1971-72 (Baht)	Change 1970-71 -1971-72 (Baht)	% Change	Mean Crop Income 1971-72 (Baht)	Change 1970-71 -1971-72 (Baht)	% Change
1st Quartile	266.52	388.93	+ 122.41	+ 45.93	366.59	100.07	+37.55
2nd Quartile	1001.25	1037.89	+ 36.64	+ 3.70	968.35	-32.90	- 3.29
3rd Quartile	1645.29	1893.29	+ 248.63	+ 15.11	1684.81	+39.52	+ 2.40
4th Quartile	1825.83	2376.57	+ 550.74	+ 30.16	2068.18	+242.35	+13.27

TABLE IX - 3

Off Farm Income Levels: Quartile Groups

Lam Pao Survey 1970-71 and 1971-72

Group	Mean Off-Farm Income 1970-71 (Baht)	Mean Off-Farm Income 1971-72 (Baht)	Change 1970-71 - 1971-72 (Baht)	% Change
1st Quartile	92.17	87.18	- 4.99	- 5.41
2nd Quartile	358.20	331.95	-26.25	- 7.33
3rd Quartile	1114.90	1066.78	-48.12	- 4.32
4th Quartile	5649.03	4180.38	-1468.65	-26.00

does appear to be doing rather better than any of the other groups. The two central quartiles show little change in income levels at current prices and marginal declines at the constant 1970-71 crop prices. The lowest quartile shows a notable increase in earnings of between 15% and 20% according to the method of measurement. The upper quartile, however, although achieving a lower percentage rise than the lowest group, do succeed in increasing their average income levels in real terms by much the largest amount. (Table IX-4).

This brief discussion has sought to illustrate some of the general trends in income level changes in the first two years of the Lam Pao sample survey. It has at the same time highlighted some of the problems in measuring such changes. Comparison over only two years of enumeration is clearly not very satisfactory, but even this must take into account the changes in crop prices and in off-farm earnings opportunities between those two years. The extent of the former changes is easily measured. It is, on the other hand, impossible to account adequately for the latter and this must affect any analysis. Thus the conclusions drawn must necessarily be tentative. Nevertheless the evidence does suggest that, if earnings from farm-based sources are isolated, then the richer 25% of farmers have increased their earnings by the largest amounts over the two years.

If the quantitative evidence of the annual cash income data is generally inconclusive, then a return must be made to more qualitative evidence as presented in the preceding chapters. From this a number of trends may be discerned which suggest that the arrival of irrigation water is likely to require a re-adjustment which the larger, richer farmers

TABLE IX - 4

Income Levels Quartile Groups

Lam Pao Survey 1970-71 & 1971-72

(Off-farm Income Excluded)

Group	Mean Income 1970-71 (a) (Baht)	Mean Income 1971-72 Current Price (b) (Baht)	Mean Income 1971-72 Constant 1970-71 Prices (c) (Baht)	Change (a)-(b) (Baht)	% Change	Change (a)-(c) (Baht)	% Change
1st Quartile	389.48	469.51	447.17	+ 80.03	+ 20.55	+ 58.69	+ 15.07
2nd Quartile	1588.90	1644.97	1565.43	+ 56.07	+ 3.53	- 23.47	- 1.48
3rd Quartile	2962.76	2914.92	2815.81	- 47.84	- 1.61	-146.95	- 4.96
4th Quartile	5530.01	6012.65	5714.26	+442.64	+ 8.00	+184.25	+ 3.33

are best suited to make.

It will be recalled that the traditional land tenure pattern in the Lam Pao irrigation area showed a close adaptation to the environmental conditions in seeking to ensure subsistence production by holding two or more plots of a different physical nature or by incorporating within a single plot land of various types. It was suggested that, with irrigation, a fundamental revaluation would be necessary on the part of farmers towards their land resources.

In those villages in which irrigation water had actually been received, two main trends were perceived. First, those farmers who had no land within the irrigible area already felt themselves to be disadvantaged and were actually seeking land within the irrigation project. Second, within the irrigation project, there appeared to be a tendency towards accumulation of land by the already larger landowners. These two trends may be linked together to produce a situation of increasing pressure on the irrigated area alongside the growth of larger landowners. This pressure is being exacerbated by the decreasing availability of land available for clearance in the area and a tendency for the subdivision of holdings, some already quite small, between many siblings in a farmer's family. This is particularly to be seen in an increased desire of male heirs, previously accustomed to develop their own land from the forest, now to insist on their rights of inheritance within the irrigated area. Where the pressure on land has reached the greatest proportions, there has been a marked increase in renting, particularly share-cropping, leaving farmers with an insecure tenure and little incentive for land improvements.

The signs of upheaval inherent in this description may be intensified with the widespread onset of second cropping in the dry season. In the Lam Pao irrigation area small-scale dry season renting is already a feature, but more important may be a trend observed at the Lam Phra Phlerng project for the redistribution of land for second cropping. Although this is at present arranged by irrigation officials and is free of charge, individual agreements are visualised as a further feature leading to land tenurial instability.

The redistribution of land holdings is a feature necessitated by the discipline imposed by the regulated irrigation system. This is equally likely to have an effect on the traditional pattern of labour organisation. In the system of rain-fed agriculture, the farmer in the study area is largely dependent upon family labour, both for the cultivation of the staple rice crop and for the more recently introduced cash crop kenaf. Where it might occasionally be necessary to enlist labour resources from outside the family, for the rice crop these were usually obtained through agreement with other families in the village community, either on a reciprocal exchange basis or through communal activity, such as the 'longkhaek' system prevalent at harvest time.

Rice is a crop grown by almost every family in the village. To date, kenaf is the main element of diversification and already it suggests that arrangements typical in the rice labour cycle are not applicable to a new and by no means ubiquitous crop. Hired labour has become the most important supplement to family labour.

From evidence drawn from other irrigation areas, such as Lam Phra Phlerng, there seems to be a tendency for hiring of

labour to increase as the farmers go their own way in selection of enterprise following irrigation development. Moreover, as second cropping is introduced, the premium for the speedy completion of each particular job in the farming calendar has increased and as a consequence the need for extra labour has also been extended. This increased requirement has been emphasised by the competition which dry season cropping faces from off-farm employment opportunities. The desire for increased cash income in the face of the temptation of more easily accessible consumer goods has been growing over the last decade. This has been satisfied partly by the permanent cropping of upland plots for cash crops like kenaf and cassava, but also by taking up employment off the farm in the dry season. This latter alternative has the advantage of giving younger members of the community, amongst whom the consumer demand is greatest, a degree of independence which the traditional system of land tenure and inheritance does not allow. Most young people in the community have little say in the management of the farm holding until they have set up an independent household and developed land for themselves; while they remain attached to their parents' household they can have little income of their own. By taking dry season off-farm employment on their own behalf, they can achieve a personal income, but at the same time this makes for difficulties for the household as a whole. The household may, as a consequence, be short of labour for the dry season and may have recourse to hiring. Whereas this could be said to have the favourable effect of ensuring some flow of benefits to those not owning land within the irrigation system through the movement of mobile labour resources onto the immobile land resource, it

imposes an extra expense on the landowner which may discourage him from participation in dry season cropping. There is in addition the possibly deleterious social effect. In any case, if the return from off-farm labour is higher or even more assured than that which could be gained from second cropping, the farmer may prefer the former where this is available.

In such circumstances, it might be argued that the phenomenon of dry season tenancy noted earlier should be encouraged, once again to spread the benefits of irrigation to those not owning irrigible land. What has been notable about the dry season tenancy arrangements, however, has been their small scale. Given that such tenants are unlikely to take on more land than they can comfortably handle with their own family labour, nevertheless the possibility of increased labour costs to the landowner may be expected to be paralleled by rent charges to the tenant. Both these costs may be added to the other costs of increasing productivity and diversification and tenants are no more likely than landowners to be able to afford the investment required.

Although capital investment has been relatively limited within the traditional agricultural system, it is likely to become more significant in the course of modernisation. Few farmers, however, have the facility to accumulate capital on their own with any regularity. Funds stored in good years are frequently eaten up by emergency and necessary social expenditures and the increased income derived from off-farm labour and upland cash cropping has only served to finance increased consumer spending.

Nor have traditional sources of credit in rural areas generally been aimed at providing funds for agricultural development. The major sources, relatives and friends in the village, have formed a fund of circulating capital to assist fellow villagers in temporary financial embarrassment. Loans have normally been small and of short duration; interest payments have been minimal. Where large funds have been required, these have been obtained from local merchants, some of whom may be fellow-villagers; here the limitation of funds and the risk of loss in conditions of severe environmental hazard have forced the lenders to charge high rates of interest.

The shortage of available capital in the traditional economy and the high rates of interest charged on loans of any size place a constraint on the development of agriculture in irrigation areas of Northeast Thailand. Where cheap credit has been made available, investment in profitable lines like Brahman cattle has demonstrated that it can have a beneficial effect on the income of the needy. At present, however, the high cost of obtaining capital favours those farmers who already have their own capital store and this applies equally to the supply of agricultural inputs on credit. Evidence in the Lam Pao irrigation area suggests that the mark-up on fertiliser bought on credit is certainly as high as would be the cost of obtaining funds to pay on cash terms.

If the supply of agricultural inputs favours those with resources of their own, so too does the marketing system of the major farm products. Only the richer farmers, with larger surpluses, can afford to move outside the confines of the local marketing system. Small farmers, with the small and irregular surplus born of unpredictable climatic conditions,

cannot easily search for their own outlets. For them the channel of sale is via village agents, district middlemen, provincial and regional millers; each extra step helps, however, marginally, to depress the farm gate price. Where the merchant is also the seller of fertiliser and other supplies, the system can bind a farmer to one particular channel of sale, although even at the village level individual merchants do not normally have a monopoly of sale. Where the farmer is short of ready cash, there can be little question of storage of the crop to wait for the improved prices of the off-season; in any case, many do not have the facilities for extended storage.

Although it may be argued that in the rice trade the marketing system provides an essential service for the small farmer, it is probably true that he could achieve a higher return with more information and greater storage facilities. In the past decade, the traditional paddy marketing system has extended to cash crops, notably kenaf. Here, where initial processing is involved, the farmer with small quantities to sell is at a greater disadvantage. Local merchants make no attempt to grade produce and thus give no premium for improved quality. Only by circumventing the initial stage in the chain and selling direct to the miller can the farmer improve the price; for the smaller producer this is only possible through pooling his produce with others.

To make a success of the investment into irrigation schemes like Lam Pao and Lam Phra Phlerng, it is essential that the mass of farmers should be able to participate in the new technology of improved crop strains, fertilisers and

pesticides and facilities for land improvement, investment in which the improvement in water control should make worthwhile. The inexperience of farmers in irrigated agriculture, the inability of a great many to make the initial investment in the new opportunities and the lack of incentives to change from the traditional way of life are all, however, preventing the widespread modernisation of the economy. In view of the increasing population pressure which has been noted, one may argue that, following Boserup's thesis,[1] technical change may be forced upon the mass of the population, but the fact remains that without help and guidance there are limitations to the efficacy of spontaneous movements. Many farmers express the desire to innovate, but the equation turning desire into actual participation is complicated. Capital, farm inputs and know-how are all necessary, but favourable pricing and marketing arrangements are also required if the farmer is to have the right incentive. Need and incentive must then be stronger than the security offered by traditional agriculture. Most of those who do actually experiment can afford to risk movement out of the traditional system.

In these circumstances it is clear that to generate development among the great mass of farmers some assistance is required from the government. In Thailand, although there are independent extension services run by the Department of Agricultural Extension, most of the government efforts to help the farmers are channelled through a variety of co-operative organisations. Co-operatives have been felt to

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1. Boserup, Esther, "The Conditions of Agricultural Growth", London, 1965.

be relevant in the context of rural development in the Third World, in that their basic philosophy is to improve the bargaining position of the smaller farmers by linking them together to form a more powerful block with like interests. They have been said to fit in well with the communal, egalitarian societies which exist in farming communities in the developing world.

Unfortunately this latter idea particularly is somewhat misconceived. The traditional society of the Third World is quite often highly stratified and in other cases, combined action within the community is at a minimum. The rural society in Thailand has in particular been characterised as a 'loosely structured' social system[2] and community spirit does not seem to be particularly strong within it. Although villagers may co-operate in the construction of temple buildings and in the excavation and renewal of village feeder roads, in the agricultural economic sphere co-operation is limited and carefully regulated. Labour assistance networks are present, but these operate, other than within the extended family, on a strictly reciprocal basis or in a festival atmosphere with vitals provided by the aid recipient. In other economic spheres there is little communal activity, certainly not in those areas now being developed as appropriate for co-operative involvement.

As a result, initiative for joining farmers together in farmers' associations has not come from the farmers themselves, but from the government, although it is true that in the last

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2. By J.L.Embree. See Evers, Hans-Dieter, (ed.) "Loosely Structured Social Systems: Thailand in Comparative Perspective", New Haven 1969.

couple of years farmer participation in administration has been growing. The government has, moreover, developed its co-operatives to solve particular problems, such as the growing farmer indebtedness in Thailand's Central Plain. In the Northeast region, the role of co-operatives has been seen, however, very much in the context of assisting the overall economic development of this backward region and much effort has been expended in recent years on the foundation and development of co-operative associations by the government. This has been particularly the case in what are seen as the show-cases of the development effort, the irrigation project areas.

An examination of the progress of agricultural development in the major irrigation projects of the region reveals, however, that the co-operatives have, as yet, made little impact on the drive to develop the agricultural economy. Farmer participation in the services offered by the co-operatives has in fact been rather low. The Lam Pao sample survey revealed that by 1972 the co-operatives at work in the area had reached no more than one quarter of farmers in the survey and of these, no more than half were taking advantage of the facilities.

This low rate of participation may be explained by a number of factors. The societies may be criticised in that they remain largely in the control of government officials, but, on the other hand, it may be argued that this must necessarily be the case in the early stages of their development. Much more important is the fact that many farmers are still ignorant of the services offered by the

co-operatives or are confused by the multiplicity of the associations at work in the area. Equally serious are administrative problems. Despite the fact that the farmers appear to recognise the value of the lower interest rates on cash loans and of the cheaper, quality controlled fertiliser and other farm inputs, many find the procedure involved in obtaining them slow and inefficient to the extent that it can be a major constraint on the success of their adoption of innovation. Some shortage of funds has also, more recently, proved a problem.

In addition the regulations of the co-operatives in regard to credit borrowing have tended to discourage participation of the farmers. Farmers have normally been expected to have a mortgageable land title deed to deposit with the society before taking a loan; evidence suggests that few farmers have such documents or the funds to afford the survey required to obtain one. In the absence of such documents, farmers wishing to take out a loan must find guarantors among their fellows, not always a simple matter for the poorer, less creditworthy families.

Indeed the system as a whole seems to be working against the smaller farmer rather than qualifying the trends towards inequality of opportunity noted earlier. Co-operative members thus far tend to be the larger, richer elements in the community and loan policies, assessing loan applications on the basis of amount of land held, may add to the problem.

Not that those farmers who are qualified to receive loans necessarily put them to notably productive uses. Information from co-operative offices and farmers alike suggests that credit is still being used for the medium-term

circulation of capital within traditional enterprises. In the upland areas loan funds are being used to extend the limits of cultivation by further forest clearance of increasingly marginal land. Throughout the district, the co-operative loans are most important in allowing the purchase of draught animals, a traditional security investment in the area. Short-term loans are being used to enable farmers to switch enterprises from year to year, but little is being done to develop land and increase the immediate productivity of agriculture. A significant percentage of loan capital is used for household consumption expenditure and again merely supplements the funds available from non-institutional sources. In the circumstances it is not surprising that the repayment record of the co-operative organisations in the district is poor.

The present performance of the agricultural co-operatives in the irrigation projects of Northeast Thailand, especially at Lam Pao, gives rise for some concern. Not only are they making little contribution to the development effort, but by policies which actually favour the richer farmers they may be contributing to the tendency for social problems of inequality to arise within and between traditional farming communities. It is clear that the co-operatives can play a wider role in stimulating development; already farmers have recognised the worth of the lower rates of interest and the standard prices for fertiliser, even when purchased on credit terms. On the other hand, it should be possible that this role could be yet wider. In the present circumstances, while the marketing of the traditional paddy crop is fairly efficient, the channels of sale and supply for other crops and commodities

in Northeast Thailand are either embryonic or non-existent. Few farmers have easy access to processing and grading facilities and long-term storage of produce is also a problem. Price information and other details of new developments which might be relevant to farmers are irregularly available, often unreliable and frequently out-of-date by the time they reach the villages.

It seems clear, therefore, that there are deficiencies in the present range of services available to the farmers in central Northeast Thailand. These deficiencies are likely to become more important as commercialisation of agriculture is sought by more farmers. Credit requirements for investment on land, labour and farm inputs will be required for a wider range of crops, about which farmers will require more and more information. In the irrigable areas in particular, farmers will require advice, assistance and funds for improvement of the new irrigation facilities.

In most of these services, the co-operative organisations have already been attempting to play a role in the Lam Pao irrigation area, but have been having little impact. Yet it is felt that some small improvements might be made, without further massive investment by the co-operatives, which would greatly extend their influence. Farmers must be encouraged to make use of the co-operative services, but they will not do so unless they feel the services offered are useful to them. Nor will they participate if unnecessary red tape is encountered in any intercourse with the co-operatives. The potential farmer members should equally be made to understand that they too have responsibilities in their relationship

with the co-operatives. Much as the traditional way of life held duties for members of the village community, so stress needs to be laid on the duties and responsibilities to fellow members of the new economic community which is the co-operative. Farmers should not regard it as a welfare service and on their part the co-operatives should not act as such. Where possible they should be economically viable, striving indeed, within the bounds of keeping prices competitive, to make profits for distribution to their farmer shareholders. How may these various aims be reconciled?

The examination of co-operatives at work in the Lam Pao irrigation area has suggested that their impact is being limited by two main factors, the regulations required for borrowing money and the lack of co-ordination between individual co-operatives and between co-operatives and other parts of the government extension service. These are essentially related problems. Farm credit borrowed only on the security of deposit of a farmer's title deed must be restricted to those possessing such a document or those with the confidence of guarantors. The ability to provide such security is, however, not necessarily related to a farmer's capacity to repay a loan, nor to a household's real capital needs. Despite ostensibly strict regulations controlling the use of co-operative loans, it is clear that these are heavily used for consumption purposes or as a means of circulating capital through the traditional economy. Supervision in the field remains at a minimum, which is scarcely surprising in view of the number of officers available. Those extension services offering technical advice to the farmer cannot provide the credit and supplies necessary to

carry through the suggestions given. The system cries out for co-ordination. An increase in the numbers of officers would be ideal, but in its absence, the activities of those available should be co-ordinated. Advice could then be given in the knowledge that it could be implemented, credit given in the belief that it would be productive and that the recipient would be capable of repaying a loan related to his capacity for repayment. Formal security would be unnecessary and farmers' confidence in the co-operative extension effort as a whole would surely be increased.

Farmers' capacity for repayment depends very heavily on two factors, the reliability of the productive capacity and their ability to get adequate returns for their produce in relation to investment costs. The co-operatives in Kalasin province have already demonstrated the ability to keep production costs as low as possible through the bulk purchase and supply of fertilisers. Genuinely profitable to the farmer, such services may be expected to continue as long as they remain so. It should equally be possible to offer him higher returns to go alongside lower costs, offering marketing facilities capable of competing with the non-institutional sector. It is true that efforts to establish such facilities in Northeast Thailand have not been encouraging, but with new crops developed as a result of extension efforts, adequate finance and supplies, a reliable market is also required. Here the private sector is likely to take time to be convinced of the viability of servicing the crop. The co-operatives through their connection with regional and national level agencies may, on the other hand, be able to assure the grower an adequate return. They may

also be able to provide grading and processing facilities allowing farmers to benefit from extension advice aimed at improving stock quality. Through provision of storage facilities they could have the ability to play the market on their members' behalf.

For such marketing services to be viable, however, the co-operative must be assured of regular participation by farmers in the market economy. Where this is erratic, then the organisation of such services becomes difficult. In the traditional economy the availability of rice for the market depended on the unreliable climatic conditions. With the development of irrigation facilities, dependence is transferred to the irrigation system. Without a regular, reliable irrigation water supply, a co-operative which expands its services too rapidly, providing extensive credit on the basis of unreliable productive assets and investing heavily in services and facilities, is likely to find itself in deficit and dependent on government subsidy. Where the irrigation system has created improved water control, a farmer has greater security to make investments, he can borrow money without fear of being unable to repay and he can develop a regular relationship with the market. On its part the co-operative providing credit and other services can regard such a farmer as an adequate risk and can afford to provide services for him.

In Northeast Thailand, however, the use of irrigation facilities is new to most farmers. The efficient transmission of the water depends as much on the education of the farm population to the use of the new facility as on the efficient management of the system by the irrigation authorities. To

get the greatest benefit from the system, farmers will be obliged to invest in maintenance and improvement of the tertiary level irrigation system as well as in their own land. This former investment needs co-operation among farmers with common interests in particular parts of the system. In the establishment of Water Users' Associations, the Thai government has provided the means of organisation for such co-operation. In the Lam Pao irrigation area, however, as at Lam Phra Phlerng, the Water Users' Associations have little capital to carry out required improvements. As a result farmers see little benefit in joining the Association. Until there are facilities to effect these requirements, farmer involvement may be affected by inefficient water supplies. This in its turn may pose problems of viability for the farmer associations in their efforts to assist the process of change.

The answer seems clear. A further co-ordination of co-operative activities is required in the irrigation areas of Northeast Thailand if the farmer associations are to make a maximum contribution to the transformation of agriculture in the area. This co-ordination should not be a token co-operation through the amalgamation of ministries or departments in Bangkok, but a true co-ordination at the field level. This includes co-operation between the Water Users' Association and the associations providing credit and other services. The assurance of reliable water supply is fundamental to the viable and effective operation of the latter organisations. The Water Users' Associations lack funds. Surely these should be provided by the co-operatives or directly from the Bank for Agriculture and Agricultural Co-operatives for later

repayment as the Associations' funds build up by levy on farmers participating in use of the irrigation water.

The receipt of reliable supplies of irrigation water will affect the individual farmer's need for co-operative services and the ability of the co-operatives to help him. Under traditional rain-fed agriculture, the risk of crop failure affects ability to repay loaned capital, the amount of risk a farmer is willing to take and the regularity of his commitment to the sale of crops. In such circumstances his membership of a farmers' association may only jeopardise the operation of that organisation. With irrigated agriculture, the greater need for capital is compensated by a greater reliability of production. The farmer can take greater risks and the co-operative can afford to allow him greater scope within the bounds of his ability to repay. Even the smaller farmers can be expected to repay loans reasonably commensurate with his productive capacity.

It seems that different strategies should be followed in the different circumstances. Until farmers have reliable water supplies, loan amounts should be very carefully controlled in terms of repayment capacity and a stress laid on short-term production loans, often in kind, along with an emphasis on extension work in preparation for management of irrigation facilities and the cultivation of new crops. Loans in kind hold particular benefits of specific use and quality control and are much more likely to benefit the farmer rather than the merchant. They do require some considerable time investment by the co-operative officers, although not as much as the strict supervision of cash loans, they call for careful co-ordination with other inputs and are inflexible, but in the

early days of development these characteristics are not unwelcome. With irrigation water, the use of capital might well justifiably increase, its use become more flexible and the supervision less strict, although the shift in emphasis may take some years. At this stage the co-operative might extend its activities into the fields of marketing and processing with greater security and to the benefit of a wider range of farmers.

APPENDIX 1

The S.O.A.S. Land Use Research Project Questinnaire on the Socio-Economic Conditions Among Farmers in the Lam Pao Irrigation Area

(Revised and Expended Version for Enumeration in 1972 Season)

Year of Enumeration... Village No.... Household No.....
Enumerated by.....
Checked by.....
Coded by.....

1. Demography

No. of Persons in the Household.....
For EACH of the Household Members, give the following details:-
(a) Name and Surname
(b) Relation to Household Head
(c) Age
(d) Sex
(e) Marital Status
(f) Place of Birth
(g) If not born in the village, Length of Residence
(h) Length of Education (Indicate if still receiving)
For any members of the family living away from home at the time of the survey, give these details also:-
(j) Occupation
(k) Place of Residence
(l) Length of Absence
(m) Frequency of Return
(n) Monthly Income
(o) Monthly Remittance to the Household.

2. Agricultural Economy

Amount of Land Owned by the Household.....
No. of Plots....
Amount of Land in (a) Field Crops.....
(b) Orchard Crops....
(c) House Plot.....
(d) Kitchen Garden...
(e) Fallow.....
(f) Uncleared Land...

For each field crop grown in the past year, give the following details:-

(a) Name of Crop
(b) Area Planted
(c) Area Harvested
(d) Production
(e) Amount Sold
(f) Total Return
(g) Price per Unit
(h) Month of Sale
(j) Where Sold
(k) To Whom Sold

3. Land Use

For each PLOT under field crops, give the following details:-

(1) Area of Plot
(2) Type of Land
(3) No. of Internal Fields
(4) Manner of Acquisition
(5) If plot is rented, Amount of Rent
(6) Adequacy of Wet Season Water Supply
(7) Adequacy of Dry Season Water Supply
(8) Method of Irrigation
(9) Area Planted
(10) Area Damaged by Drought, Flood, Insects, Disease or any Other Agency
(11) Area Harvested
(12) Production
(13) Normal Production
(14) Comparison with Previous Year's Production
(15) Amount Sold

(16) Date of First Ploughing
(17) No. Persons from Household Involved
(18) No. Days Taken
(19) Amount of Manure Put On
(20) Amount of Chemical Fertiliser Used
(21) Cost of Chemical Fertiliser
(22) If Hired Labour used, No. Persons
No. Days
Daily Rate of Pay

(23) If Tractor Hired, Area Used
Cost per Unit Area/per Hour
(24) Date of Second Ploughing
(25) No. Persons from Household Involved
(26) No. Days Taken
(27) If Labour Hired, No. Persons
No. Days
Daily Rate of Pay
(28) If Tractor Hired, Area Used and Cost
(29) Date of Start of Seed Bed Preparation
(30) Area of Seed Bed
(31) Length of Time Seedlings in Seed Bed
(32) Amount of Seed Used
(33) Amount of Manure Used
(34) Amount of Chemical Fertiliser Used (Add Cost to Item 21)
(35) Date of Transplanting
(36) No. Persons from Household Involved
(37) No. Days Taken
(38) No. Relatives Assisting
(39) No. Days of Assistance
(40) No. Neighbours Assisting
(41) No. Days of Assistance
(42) If Labour Hired, No. Persons
No. Days
Daily Rate of Pay
(43) How Many Times Weeded
(44) No. Persons from Household Involved
(45) No. Days Taken
(46) If Labour Hired, No. Persons
No. Days
Daily Rate of Pay
(47) How Many Times Insecticide Applied
(48) Cost of Insecticide
(49) Date of Harvesting
(50) No. Persons from Household Involved
(51) No. Days Taken
(52) No. Relatives Assisting
(53) No. Days of Assistance
(54) No. Neighbours Assisting
(55) No. Days of Assistance

(56) If Labour Hired, No. Persons
No. Days
Daily Rate of Pay

(57) If Second Crop Planted After the Harvest, Name of Crop
(58) Area Planted
(59) Date of Ploughing
(60) No. of Persons from Household Involved
(61) No. Days Taken
(62) Date of Planting
(63) No. Persons from Household Involved
(64) No. Days Taken
(65) Date of Harvesting
(66) No. Persons from Household Involved
(67) No. Days Taken
(68) If Relatives Assist with Second Crop, No. Persons
No. Days
(69) If Neighbours Assist with Second Crop, No. Persons
No. Days
(70) If Labour Hired for Secon Crop, No. Persons
No. Days
Daily Rate of Pay
(71) If Tractor Hired for Second Crop, Cost per Hour/Unit Area
(72) Second Crop Production
(73) Amount Sold
(74) When Sold
(75) Price per Unit

(76) If the plot is irrigated in the wet season, Name of Crop to be Grown and Planned Area Planted. (Up to 3 Crops)
(77) If the plot is irrigated in the dry season, Name of Crop to be Grown and Planned Area Planted. (up to 3 Crops)
(78) Area of Plot to be Used as Fish Pond.

(79) If the plot is upland, Extent of Suitability for:-
(a) Kenaf
(b) Cassava
(c) Peanuts
(d) Sweet Potato
(e) Maize
(f) Sorghum

3a. Other Agricultural Labour Use

(a) In the past year, if any members of the household helped in a "Longkhaek" agreement, No. Persons
No. Days
Form of Employment

(b) In the past year, if any members of the household helped other farmers apart from "Longkhaek", No. Persons
No. Days
Form of Employment

(c) In the past year, if any members of the household did agricultural wage labour, No. Persons
No. Days
Form of Employment
Daily Rate of Pay

(d) In the past year, if any members of the household had other paid employment, No. Persons
No. Days
In Which Months
Form of Employment
Daily Rate of Pay

4. Kitchen Garden and Orchard Crops

(a) Area of Kitchen Garden.....
(b) Area of Orchard.....

For all crops grown, give the following details:-
(c) Name of Crop
(d) Unit of Production
(e) Production
(f) No. Sold / Amount Sold
(g) Price per Unit
(h) Total Return
(j) Date of Sale
(k) Sold To Whom
(m) Place of Sale

5. Livestock Rearing

(i) For Buffaloes and Cattle, give the following details:-
(Separate Indigenous and Improved Cattle)
(a) No. Head Under 3 Years of Age
(b) No. Head 3-5 Years Old

(c) No. Head Over 5 Years of Age
(d) No. Bought Last Year
(e) Price per Head
(f) When Bought
(g) Where Bought
(h) Bought from Whom
(j) No. Sold Last Year
(k) Price per Head
(m) When Sold
(n) Where Sold
(o) Sold to Whom

(p) If Buffaloes or Cattle Hired, Type of Animal
No. Hired
No. Months Hired
Cost in Cash
Cost in Rice

(q) If Buffaloes or Cattle Hired Out, Type of Animal
No. Hired Out
No. Months Hired Out
Return in Cash
Return in Rice

(ii) For Pigs, give the following details:-
(a) No Head Under 6 Months Old
(b) No. Head 6-12 Months Old
(c) No. Head Over 12 Months Old
(d) No. Sows
(e) No. Boars
(f) No. Bought Last Year
(g) Price per Head
(h) When Bought
(j) Where Bought
(k) Bought from Whom
(m) No. Sold Last Year
(n) Price per Head
(o) When Sold
(p) Where Sold
(q) Sold to Whom

(iii) For Poultry, give the following details:- (Chicken, Ducks, Geese and Turkeys)
(a) No. Birds Under 3 Months Old
(b) No. Birds 3-6 Months

(c) No. Birds Over 6 Months Old
(d) No. Birds Sold Last Year
(e) Price per Bird
(f) No. Eggs Sold
(g) Price per Egg
(h) Where Sold
(j) Sold to Whom

6. Fishing

(a) Quantity of Fish Caught
(b) Main Months of Fishing Activity
(c) Method of Catching
(d) Cost of Equipment
(e) Quantity Sold
(f) Price
(g) Where Sold
(h) To Whom Sold

7. Handicrafts

For each type of handicraft made, give the following details:
(a) Type of Handicraft
(b) No. Persons Involved
(c) No. Pieces Made in Past Year
(d) No. Sold
(e) Price per Unit
(f) Cost of Repair of Equipment
(g) Cost of Hire of Equipment
(h) Cost of Raw Materials

8. Other Sources of Income

For each source of income, give the following details:-
(a) Source of Income
(b) No. Persons Involved
(c) No. Days Spent so Occupied
(d) Place of Employment
(e) Gross Income
(f) Net Income

9. Standard of Living

(a) If the subject owns his own house, How Long Built
(b) Date of Any Major Repair
(c) Cost of Any Major Repair

(d) Date of Any Major Extension
(e) Cost of Any Major Extension
(f) If Any Member of Household Owns a Wristwatch, Date of Purchase
(g) Cost
(h) Desire/Lack of Desire to Buy a New One
(i) If None Owned, Desire/Lack of Desire to Buy
(j) The Questions (f) - (i) are repeated for the following articles:-
Radio
Bicycle
Sewing Machine
Water Pump
Motor Cycle
(k) No. Visits Paid to Kalasin Last Year
(m) Main Months of Visits (Up to 3)
(n) No. Visits Paid to Yang Talat Last Year
(o) Main Months of Visits (Up to 3)
(p) Date of Last Visit to Mahasarakham
(q) Date of Last Visit to Khonkaen
(r) Date of Last Visit to Roi-et
(s) Date of Last Visit to Khorat
(t) Date of Last Visit to Bangkok
(u) Date of Last Visit to Northern Region
(v) Date of Last Visit to Southern Region
(w) Date of Last Visit to Central Plain (ex Bangkok)

10. Co-operative Membership

(a) If a member of any of the following co-operatives, Give Date of Joining
Agricultural Credit Co-operative
Land Co-operative
Bank for Agriculture and Agricultural Co-operatives
Farmers' Group
Peoples' Irrigation Association
Water Users' Association
Multi-Purpose Co-operative
Other
(b) If Money Borrowed from the Co-operative, How Much
(c) At What Rate of Interest
(d) Whether All Has Been Repaid

(e) Borrowed from Which Association
(f) For What Purposes (Up to 3)

11. Banking and Credit

(a) If Bank Account Held, At Which Bank (Up to 3)
(b) How Much Deposited
(c) If Money Borrowed from Bank, How Much
(d) At What Rate of Interest
(e) For What Purposes (Up to 3)
(f) Whether Repaid or Not
(g) If Money Borrowed from Any Other Source, Which (Up to 3) For Each Source, Give Details:-
(h) Amount Borrowed
(i) Monthly Rate of Interest
(j) Over What Period Borrowed
(k) To What Purpose (Up to 2)
(m) Whether Repaid or Not

12. Needs and Aspirations

State Whether the Household has Received Monetary Assistance for Any of the Following:-

(a) Purchase of Agricultural Land
(b) Hiring Labour for Land Clearance
(c) Hiring Labour for Crop Production
(d) Purchase of Draught Animals
(e) Purchase of Seed, Fertiliser or Insecticide
(f) Hire of Tractor
(g) Purchase of Agricultural Implements
(h) House Construction or Repair
(i) Land Development
(j) Others
(k) Financial Assistance Desired for Agricultural Development For What Purposes (Up to 4)
(m) Given More Capital, What Investment Intentions (Up to 4)

13. Development

(a) Dates of Visits to Agricultural Experimental Stations (Give for up to 3 Locations)
(b) State Whether Has Knowledge of, Has Used or Is Currently Using the Following:- New Rice Varieties.
(c) New Upland Crop Strains

(d) Water Pump
(e) Irrigation Methods
(f) Chemical Fertilisers
(g) Insecticides
(h) Tractors
(i) Indicate Satisfaction/Non-Satisfaction with Prices of the Following:- Rice
(j) Kenaf
(k) Other Crops
(m) Livestock
(n) Indicate Satisfaction/Non-Satisfaction with Interest Rates Charged by the Following:- Co-operatives
(o) Banks
(p) Merchants
(q) Neighbours
(r) Relatives
(s) Indicate Satisfaction/Non-Satisfaction with Costs of Transport.
(t) Indicate Desire/Lack of Desire for Advice on the Cultivation of Non-Rice Crops in the Wet Season
(u) Indicate Desire/Lack of Desire for Advice on the Cultivation of Non-Rice Crops in the Dry Season

APPENDIX 2

SOCIO - ECONOMIC ORGANISATION QUESTIONNAIRE

(As used by the writer in 1970-71. Substantial parts were later incorporated in the main Lam Pao survey questionnaire in subsequent years)

Name of Village..... Household Reference No.....

Name of Household Head..... Age of Household Head.....

Composition of Family: No. of Men (Age 15-65).....

No. of Women (Age 15-65).....

No. Children (under 15).....

No. Aged Dependents (Age 65+).....

I. LAND HOLDING

Size of Holding..... No. of Separate Plots.....

For each plot, supply the following details:-

(a) Manner of Acquisition

(b) If Rented, rented from whom

(c) If Rented Out, to whom

(d) Amount of Rent (Cash or Rice)

(e) If Owned, form of title deed

(f) If Bought, price and date of purchase

II. LAND USE

For each crop grown, supply the following details:-

(a) Type of Crop

(b) Area Planted

(c) Area Harvested

(d) Production

(e) Amount Sold

(f) Price per Unit

(g) Total Return

(h) Where Sold

(i) Sold to Whom (Name where possible)

III. CASH INPUTS

For each input purchased (Fertiliser, Insecticide, Seed, Insecticide Sprayer or Water Pump), supply the following details:-

(a) Crop on which Input is used

(b) Amount Used (Where Applicable)

(c) Price / Price per Unit

(d) Cost of Fuel (Water Pump)

(e) When Purchased

(f) Cash or Credit Purchase

(g) Where Purchased

(h) From whom Purchased (Name if Possible)

For any input hired (Water Pump, Tractor, Buffalo), supply the following details:-

(a) Price of Hire (including fuel)

(b) Period of Hire

(c) Where Hired

(d) From whom Hired

IV. LABOUR INPUTS

For Rice, Kenaf and Other Crops, for each of the following processes:- Land Preparation, Planting or Transplanting, Weeding, Harvesting and Processing, give the following details of labour use:-

(a) No. Persons in Household Involved

(b) No. Days Taken

(c) No. Persons Assisting without Payment

(d) For How Many Days

(e) No. Persons Hired

(f) For How Many Days

(g) Daily Rate of Pay

(h) If any help was received through "Longkhaek", No. Persons.

(i) No Days of Assistance in "Longkhaek".

If members of the family worked off the farm in the year, give the following details:-

(a) Date of the Work

(b) Type of Work

(c) No. Persons Involved.

(d) No. Days of Work

(e) Rate of Pay (If Paid Employment)

(f) Place of Work (Specify the Employer if Possible)

If members of the Family were involved in "Longkhaek", state how many persons and the number of days spent.

V. CAPITAL INPUTS and CO-OPERATIVES

If the household is a member of a farmers' co-operative, give the following details:-

(a) Type of Co-operative(s)

(b) Date Joined

(c) Date of Loan of any Money Borrowed from the Co-operative

(d) Amount of Loan(s)

(e) Whether Repaid (date of repayment)

(f) Use of Loan(s)

If the household has a Bank Account, state the Name of the Bank and the amount deposited. If any loan has been made from the Bank, give the details (c)-(f) above for each loan.

If the household has borrowed money from any other sources in the past year, for each loan give details (c)-(f) above as well as

(g) Source of the loan (name if possible)

(h) Monthly Rate of Interest

If the household borrowed rice last year, what quantity and from whom was it borrowed (name if possible)?

VI. ATTITUDES TO ORGANISATIONS

If the household holds membership of a farmers' co-operative, ask in what ways the co-operative has assisted it since joining. Is any way specific to a particular organisation? Whether the household has membership or not, ask how a co-operative should help farmers. Which form of help is considered most important if more than one if offered ?

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